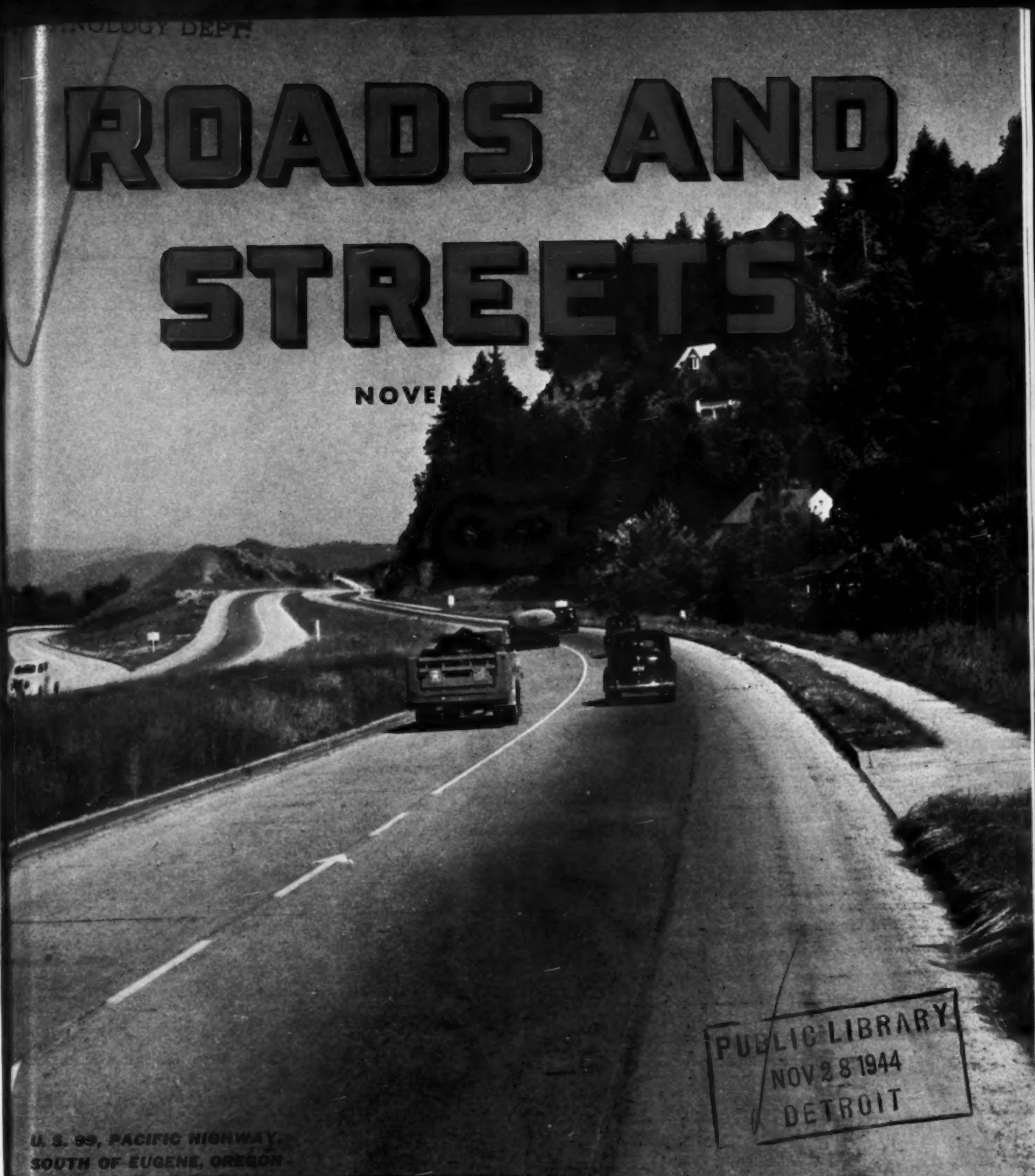
...NOLOGY DEPT.

ROADS AND STREETS

NOVE... 19...



U. S. 99, PACIFIC HIGHWAY, SOUTH OF EUGENE, OREGON

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3 FEATURES

AVAILABLE ONLY IN ADAMS MOTOR GRADERS

PROBABLY no one motor grader on the market has an important operating feature which cannot be found in some other motor grader but that doesn't mean that all motor graders are alike or of equal value. Only in Adams do you get the combination of the three operating advantages described below which are preferred by most experienced operators:

❶ 8 Forward Speeds . . . High Transport Speed

Wide working range permits operator to select exact speed to make each cut at fastest practicable rate. Result—more work done per day . . . Transport speeds run as high as 21 mph.

❷ Accurate, Dependable, Mechanical Controls

Not only operate easily and quickly but, because they always operate at uniform speed, provide more accurate adjustments than do hydraulic controls. Two adjustments can be made at same time without affecting speed of either.

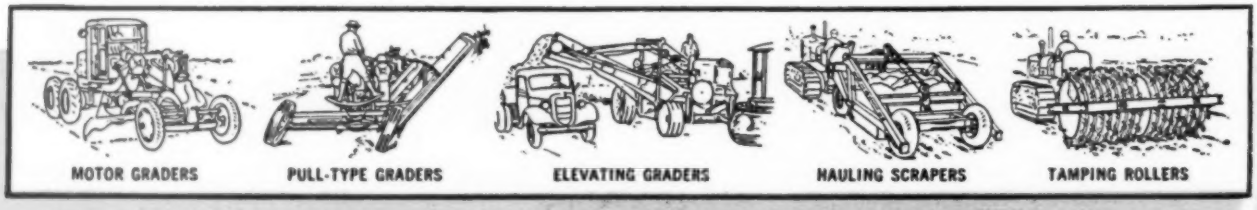
❸ Push-Button Starting From Operator's Cab

Electrically-equipped Adams machines are started as easily as your automobile in any kind of weather. Saves time and tempers on cold mornings.

In addition to these features, you get Strength and Durability . . . Well-Balanced Weight Distribution . . . Adequate Power and Traction . . . Adaptability to a Wide Range of Jobs . . . Economical Operation and "near-by" Adams Service wherever you go . . . See your local Adams dealer now about your post war requirements.

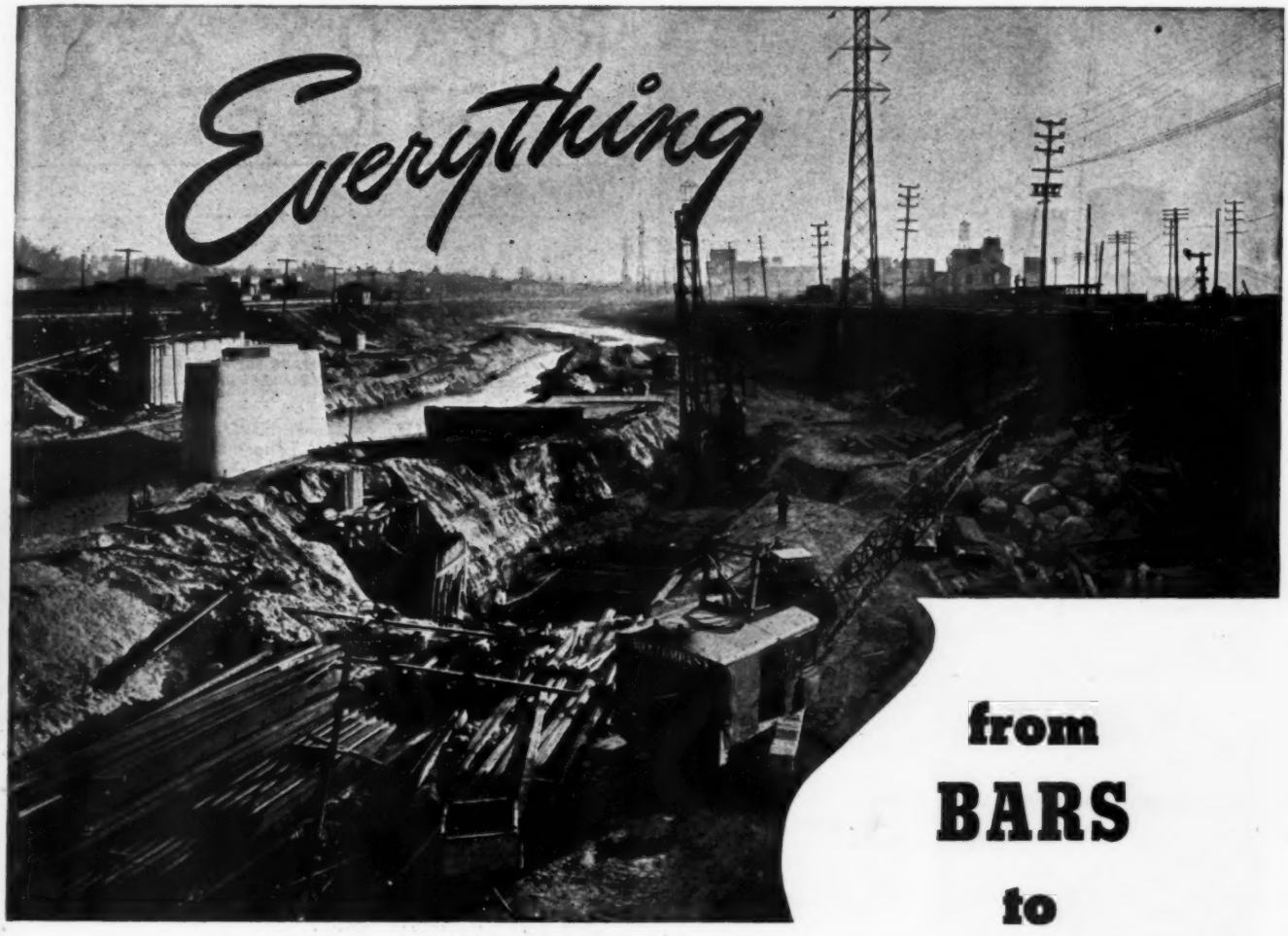
J. D. ADAMS COMPANY • INDIANAPOLIS, IND.

At war's end we'll need many new roads and many jobs for returning service men. Plan post war projects now and meet both needs.



ADAMS

☆ ROAD-BUILDING AND ☆
EARTH-MOVING EQUIPMENT



from BARS to SHEET PILING

That's what road builders will be able to obtain from Bethlehem warehouses when unrestricted building is resumed, as they did before the war. Contractors have found that it pays to make Bethlehem headquarters for all steel products used in building highways, streets, roads and highway bridges. Time, money and trouble can be saved by choosing needed products from Bethlehem's complete line, and obtaining them on a single order.

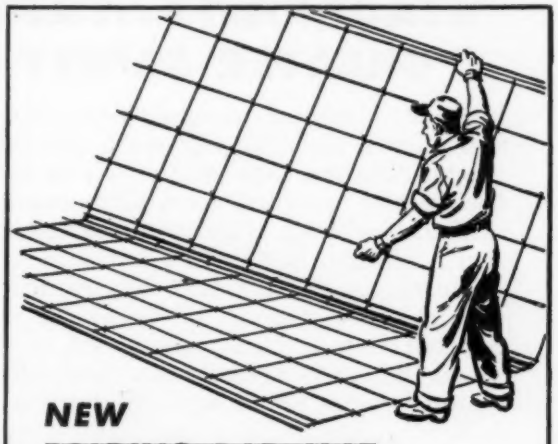
Whatever road steel products you need—bars, pipe, mesh, road joints, wire rope, steel highway guards and posts, piling for either retaining or load-bearing structures, or any other item listed below—you'll find that Bethlehem products are sturdy and reliable. They're designed and built for rugged performance.

Post-war highway projects are now rapidly shaping up. Let Bethlehem help you get going fast when the word is given. For full information about Bethlehem road steel and allied products, get in touch with the nearest district office, or write direct to Bethlehem Steel Company, Bethlehem, Pa.

OTHER BETHLEHEM PRODUCTS FOR HIGHWAYS

Road Joints Dowels Dowel Bar Supports Center Strip
Wire Rope and Strand Bar Ties Guard Rails
Anchor Rods Right-of-Way Fence and Posts Pipe
Hollow Drill Steel Digging Bars Structural Steel
Reinforcing for Concrete Pipe
Bridge Floor Reinforcing Corrugated Sheets
Concrete Slab Spacers Turnbuckles
Tie Rods, Spikes, Bolts and Nuts
Highway Guard Posts and Brackets
Timber Bridge Hardware Sheet and H-Bearing Piling

BETHLEHEM STEEL



NEW
FOLDING BAR MAT

For convenient handling and stockpiling in wide widths, Bethlehem has developed a new hinged reinforcing-bar mat which folds over double. Made like the regular bar mat, of deformed bars clipped together, it is easier to truck, and can be handled by two men. It is less likely to be damaged in handling, is readily installed, and lies flat.

Bethlehem reinforcing bars, plain and deformed, are made of new billet steel in standard sizes and grades, and can be bent to shape and cut to size in most Bethlehem warehouses.

The above night view, taken at 400 feet, clearly illustrates the clarity and readability of this 2' x 4' SCOTCHLITE reflecterized directional highway marker.

NEW SCOTCHLITE SIGNS GIVE LONG RANGE READABILITY... AND GREATER SAFETY

Legends and symbols on signs reflectorized with SCOTCHLITE are definitely more readable at greater distances night and day. This new reflective sign material gives signs maximum brilliance without glare or distortion of the sign's message. SCOTCHLITE comes in flexible roll form up to 24" in width—50 yards in length and in white, yellow, silver or red colors. SCOTCHLITE is easy and time saving to apply; by far the most efficient, economical reflective material to use for all sign reflectorizing jobs.

Available in Roll Form

Scotchlite

REG. U.S. PAT. OFF.

REFLECTIVE SIGN MATERIAL 24 Hour Visibility

Made and Patented in U.S.A. by

MFRS. 3-M PRODUCTS

MINNESOTA MINING AND MANUFACTURING CO.

GENERAL OFFICES: SAINT PAUL 6, MINN.

BRANCHES IN PRINCIPAL CITIES

ROADS AND STREETS

Vol. 87, No. 11 November, 1944

ECA

A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; and to the construction and maintenance of airports.

WITH ROADS AND STREETS HAVE BEEN COMBINED GOOD ROADS MAGAZINE AND ENGINEERING & CONTRACTING

HALBERT P. GILLETTE, President; EDWARD S. GILLETTE, Publisher; HAROLD J. McKEEVER, Editor; CHARLES T. MURRAY, Managing Editor; JOHN C. BLACK, Field Editor; LT. COL. V. J. BROWN, Publishing Director (Absent on Military Duty); H. J. CONWAY, Advertising Editor; L. R. VICKERS, Promotional Director.

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This is *One* of 896 MOTO-CRANE JOBS

Since Moto-Crane Service, Inc., Detroit, started in 1940, they've completed 896 separate jobs covering every phase of material handling, excavating and rigging.

Some jobs lasted only a few hours, others up to 17 months; one was 240 miles from Detroit. To handle the steadily increasing demand for Moto-Crane service, this organization has built up a fleet of 6 Lorain Moto-Cranes.

Similar reports from hundreds of other Moto-Crane owners—Service Companies, Contractors, Steel Erectors, Industrials — are further proof that Moto-Crane *mobility, speed-in-transit and ready convertibility to* Shovel, Crane, Dragline and Clamshell provide the profitable answer to many postwar excavating and material handling problems.

Quick Facts About the Moto-Crane

THE CRANE

1. Simplified Center Drive direct-to-the-point power application.
2. Balanced turntable design, to provide the greatest capacities per pound of weight.
3. Steel erector's precision boom hoist with positive power control of boom lowering.
4. 2-piece, pin-connected all-welded boom with center sections and straight or gooseneck tips.
5. Cab type tagline which functions efficiently at all boom angles and digging depths.
6. Convertible to Crane, Shovel, Dragline, and Clamshell.

THE CARRIER

1. 3-axle mounting on 10 rubber tires. Both tandem rear axles drive.
2. High speed transmission range for road travel — low range for off-the-road travel.
3. Close-coupled, 175" wheelbase for better maneuvering.
4. Steering gear designed for soft ground travel.
5. Special chassis frame. No Moto-Crane frame has ever failed.
6. 10 speeds forward—and 2 reverse. Unit will climb a 30% grade.

Ask your Lorain distributor for the big 32-page catalog showing 78 ways to speed work — save money with a Lorain Moto-Crane.

THE THEW SHOVEL COMPANY • Lorain, Ohio

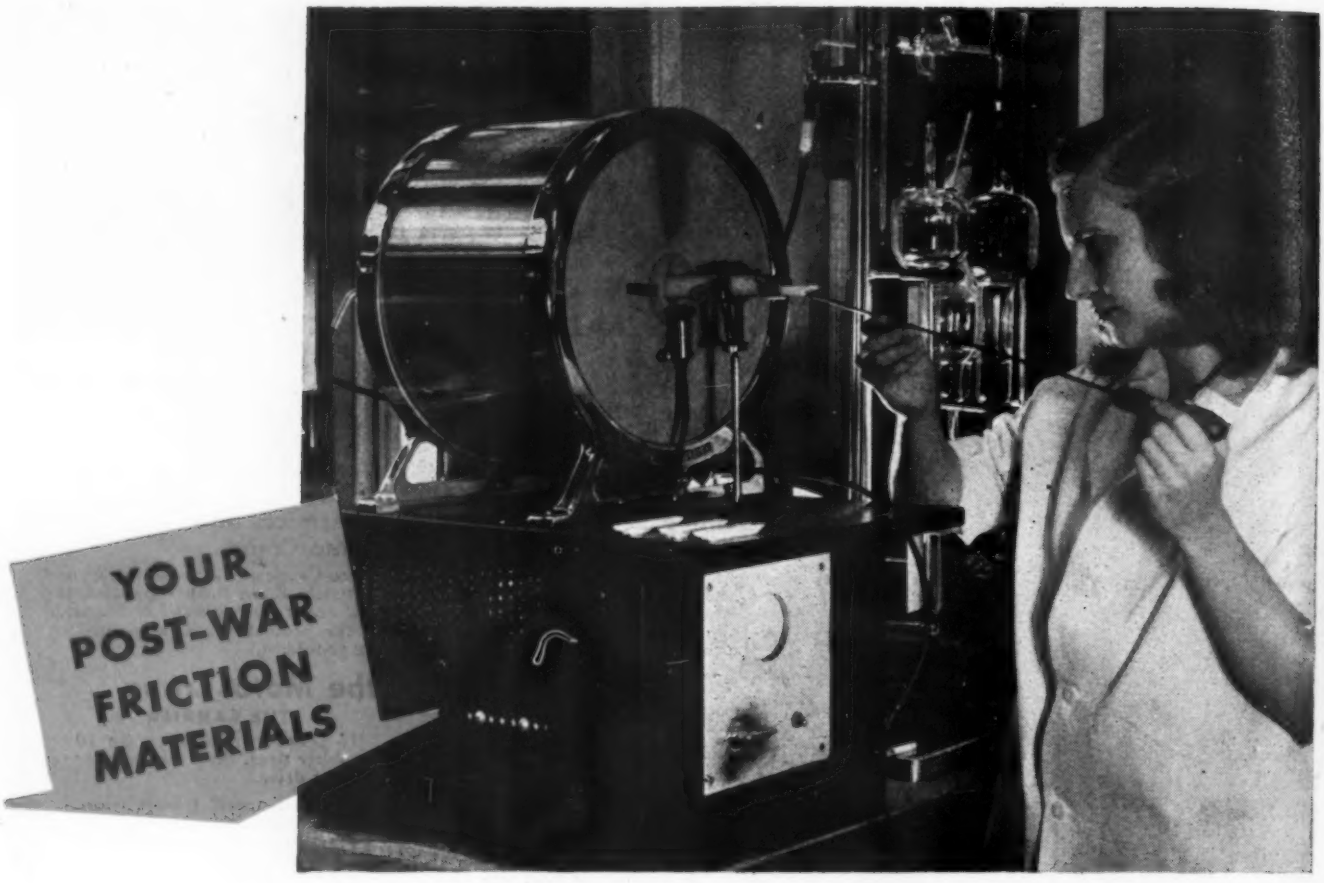
2 Moto-Cranes, with 90' booms lifting a 6½-ton bottle washer to the 6th floor level.

Reg. Trade Mark

thew-Lorain

It's not a MOTO-CRANE unless it's built by THEW-LORAIN

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES



...are being perfected NOW!

MEASURING the exact amount of carbon in each Velvetouch formula, as shown in the photograph above, is only one of many controls by which we assure uniformity of quality. Our laboratories are engaged in never-ending research to improve still further the friction qualities of Velvetouch *all-metal* clutch facings and brake linings . . . so that your earth-moving equipment will start and stop more smoothly, more dependably.

THE S. K. WELLMAN COMPANY
1374 EAST 51st STREET • • CLEVELAND 3, OHIO

Velvetouch is *all metal*—a combination of powdered metals, compressed, sintered and welded to a solid steel backing.

For Brake and Clutch . . . Use Velvetouch

The "INSIDE STORY" of POWDER METALLURGY

CHAPTER 1. Powdered metals—iron, lead, tin, etc.—first are carefully blended in the right proportions for each type of brake and clutch. After thorough mixing, they are ready for the molding and sintering operations.

A LETTER

GENERAL CONSTRUCTION COMPANY
337 SOUTH HIGH STREET
COLUMBUS, OHIO
ADams 7823

May 29, 1944

Northwest Engineering Co.
28 E. Jackson Blvd.
Chicago, Illinois

Gentlemen:

We wish to thank you for the prompt and efficient way you have taken care of our requests for repair parts.

Although the maintenance and repairs of our Northwest Shovels are the lowest of any shovel which we use, it is indeed gratifying to know that when an occasional repair part is needed, your firm has certainly co-operated with diligence and promptness. Considering the present times, that is certainly an achievement, of which you should be proud.

We believe that you not only have a good product, but also that you co-operate with the user from the time the product is sold and for as long as the user operates it, that, gentlemen is just as important as the quality of the product itself.

Thanking you,

Yours very truly,
GENERAL CONSTRUCTION CO.

L. A. Guzzo (Partner)

LAG/al

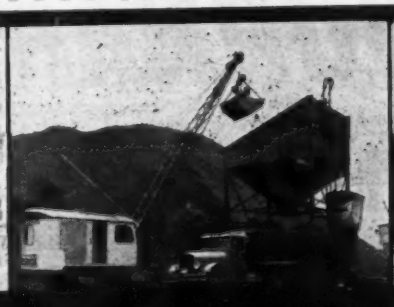
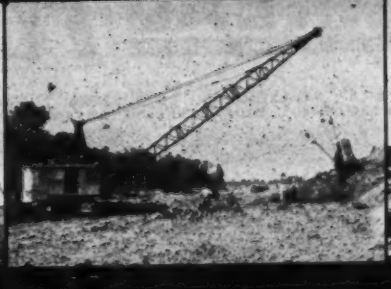
We never have been great believers in testimonial letters. We have always felt that anyone could secure a testimonial letter from his friends. But when this unsolicited letter from the General Construction Company of Columbus, O., came in it was so sincere, so gratifying and so indicative of the type of service we maintain for Northwest users that we decided it was worth your reading, too.

Remember Northwest never obsoletes a Northwest in service. You can always get parts for your Northwest no matter what the model.

NORTHWEST ENGINEERING CO.
1732 Steger Bldg., 28 E. Jackson Blvd., Chicago 4, Illinois

-and when you have a real Rock Shovel you won't have to worry about output in dirt

SHOVELS . . . . . CRANES . . . . . DRAGLINES . . . PULLSHOVELS

It Will Pay You to Make the Nearest
LeTOURNEAU DISTRIBUTOR
your EARTHMOVING HEADQUARTERS

He Specializes in Fast, Rubber-Tired Power . . . Is Equipped and Trained to Provide Quick, Expert Service . . . Can Help You on Priorities

Your LeTourneau distributor was selected for his knowledge of construction equipment and his ability to render complete parts and repair service to LeTourneau users. Both his sales and service staffs have taken refresher courses to bring to you the latest and best war-tested practices of repair and equipment application.

When you need parts and repair service or new equipment, call your nearest LeTourneau distributor. He's listed below—he can help you get machinery for essential jobs NOW.

For faster, lower-cost earthmoving, use the rubber-tired power of Tournapulls.

ALABAMA
Construction Equipment Co., North Birmingham, Montgomery
CALIFORNIA
Crook Company, Los Angeles
Soulé Equipment Company, Oakland, Sacramento, Fresno
COLORADO
The Colorado Builders' Supply Co., Denver
CONNECTICUT
The Nicoll-Talcott Co., Hartford
FLORIDA
Florida Equipment Company, Jacksonville, Miami, Tampa
GEORGIA
Gill Equipment Co., Atlanta
IDAHO
The Sawtooth Company, Boise, Twin Falls
ILLINOIS
Chicago Construction Equipment Co., Chicago, Peoria
INDIANA
Indiana Equipment Co., Inc., Indianapolis
IOWA
James W. Bell Co., Cedar Rapids
LOUISIANA
Universal Tractor & Equipment Co., Baton Rouge, Shreveport
MARYLAND
General Supply & Equipment Co., Inc., Baltimore
MASSACHUETTS
Parker-Danner Company, Hyde Park
MICHIGAN
Cyril J. Burke, Detroit
Contractors Machinery Co., Grand Rapids
Straits Engineering Company, Sault Ste. Marie
MINNESOTA
Phillippi-Murphy Equipment Co., Minneapolis
MISSOURI
The Victor L. Phillips Co., Kansas City
Rozier-Ryan Company, St. Louis
MONTANA
Montana Powder & Equipment Co., Helena
NEBRASKA
Miller-Hasselbalch Co., Omaha
NEVADA
Sierra Machinery Co., Reno
NEW HAMPSHIRE
Parker-Danner Company, Goffstown
NEW MEXICO
Contractors Equipment & Supply Co., Albuquerque
NORTH DAKOTA
Smith Commercial Body Works, Inc., Fargo
OHIO
Gibson-Stewart Co., Cleveland
OKLAHOMA
Wylie-Stewart Company, Oklahoma City
OREGON
Loggers & Contractors Machinery Co., Portland, Eugene and Klamath Falls
PENNSYLVANIA
Furnival-Rimmer Co., Philadelphia
Dravo-Doyle Company, N. S. Pittsburgh
RHODE ISLAND
Parker-Danner Company, Providence
SOUTH CAROLINA
Concrete Construction and Supply Co., Columbia
TENNESSEE
Dempster Bros., Inc., Knoxville
Tri-State Equipment Co., Inc., Memphis
TEXAS
Conley-Lott-Nichols Machinery Co., Dallas
Contractors Equipment & Supply Co., El Paso
J. E. Ingram Equipment Co., San Antonio
UTAH
Landes Engineering Co., Salt Lake City
VIRGINIA
Phillips Machinery Co., Richmond
WASHINGTON
Pacific Hoist & Derrick Co., Seattle
WISCONSIN
Hunter Tractor & Machinery Co., Milwaukee

CANADA

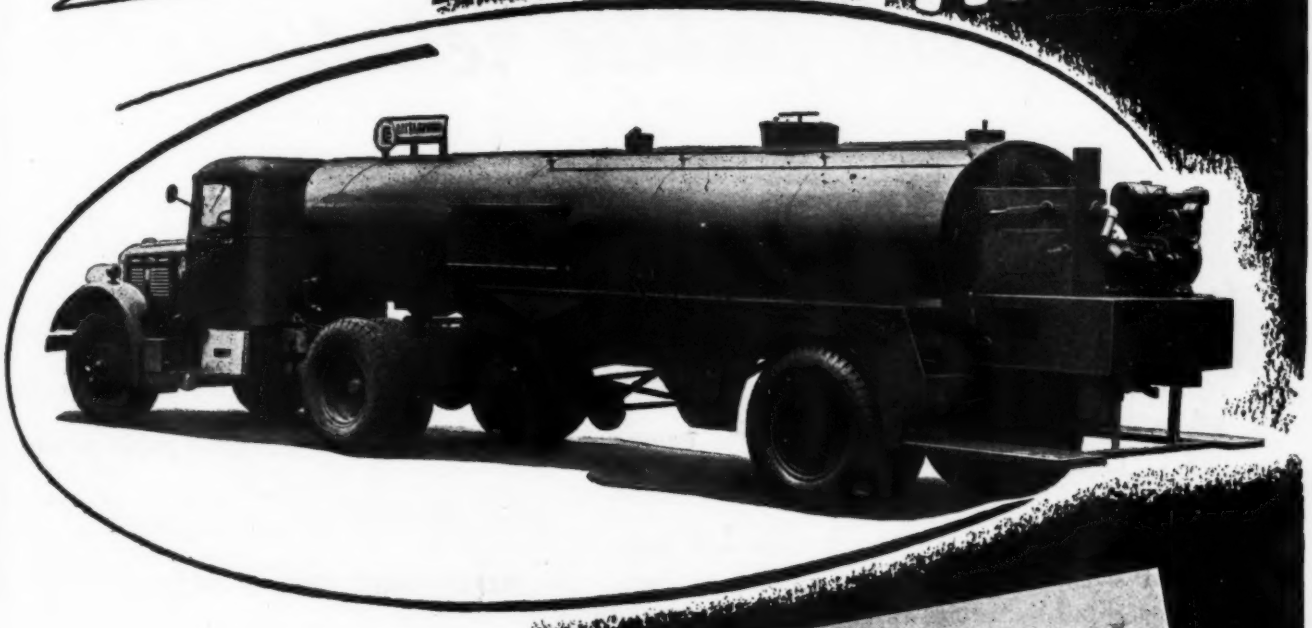
ALBERTA
Costello Equipment Co., Ltd., Calgary
BRITISH COLUMBIA
Vancouver Equipment Corp., Ltd., Vancouver
MANITOBA
Mumford, Medland, Ltd., Winnipeg
ONTARIO
The General Supply Co. of Canada, Ltd., Toronto
QUEBEC
The General Supply Co. of Canada, Ltd. (branch) Montreal
SASKATCHEWAN
J. R. Paisley, Ltd., Regina

For expert repair and genuine parts, be sure to contact your official LeTourneau distributor—he's listed above.

LETOURNEAU TOURNAPULLS

Manufacturers of TOURNAPULLS*, ANGLEDOZERS*, BULLDOZERS, TILTDOZERS*, CARRYALL* SCRAPERS, POWER CONTROL UNITS, ROOTERS*, TOURNATRAILERS*, TOURNACRANES*, TOURNATRUCKS*, SHEEP'S FOOT ROLLERS, TOURNAROPE*, TOURNAWELD*, TOURNALIFTS*.
*Trade Mark Reg. U. S. Pat. Off.

LITTLEFORD SUPPLY TANKS



FRAMELESS CONSTRUCTION A NEW FEATURE

Haul Asphalt, Tar, Road Oils, or Emulsion to the job in a Littleford Supply Tank. Don't let the haulage problem slow up your application work—keep the Distributors spraying while the Supply Tanks make the long hauls. Littleford Supply Tanks are designed to do the material hauling more efficiently because they're equipped to take care of all types of materials. They are made with or without heating systems, transfer pumps, etc.

The new Littleford Frameless Construction eliminates the trailer frame; the tank is self supporting; the cost is less; the tank has better load distribution and lower center of gravity.

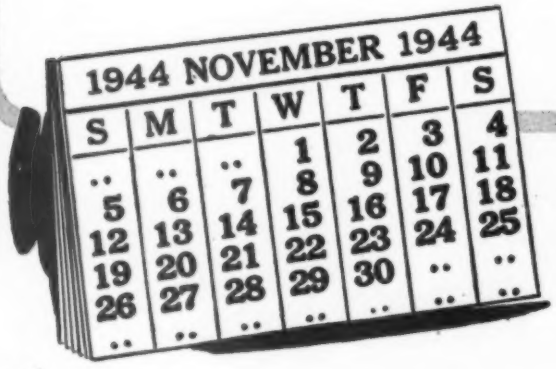
For Better Post War Road Construction and Maintenance, use the best in Equipment, use Littleford Black Top Road Construction and Maintenance Equipment.

LB LITTLEFORD

BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE - 1909

LITTLEFORD BROS., INC., 454 E. PEARL ST., CINCINNATI 2, OHIO

Time to order a carload of Good public relations!



State, county and city officials know the value of good public relations. They know, too, that the surest way to enjoy good public relations is to give good public service.

STERLING "Auger-Action" Rock Salt will help hundreds of street and highway maintenance engineers give good public service this winter — just as it has helped them in many a winter before — by keeping roads and streets open, free from treacherous ice and snow. Despite critical shortages of manpower and equipment they know that Rock Salt can be depended upon to do a snow and ice removal job quickly, efficiently and economically.

Small wonder, then, that more and more states, counties and cities are turning to Sterling "Auger-Action" Rock Salt this year when roads and streets must be kept open to speed men and materials to the nation's war production plants.

Unless you are using Rock Salt for ice control on streets and highways within your area, take advantage of the offer below.

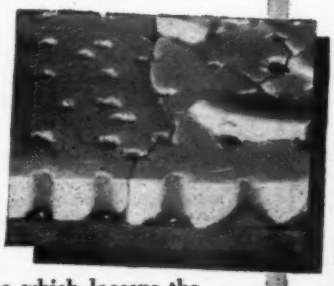
Ask for Free Consultation On Your Ice Control Problems

Highway Departments save from one-third to one-half by using Sterling Rock Salt for ice prevention. Cities — large and small — have cut snow removal budgets — kept public and private transportation moving in winter's heaviest storms with Rock Salt. Write today for bulletin containing all the facts on the most efficient and economical solution to your snow and ice removal problems. Free consultation with an International Field Engineer upon request. International Salt Company, Inc., Dept. RS-2, Scranton, Pa.

ROCK SALT STOPS CAKING

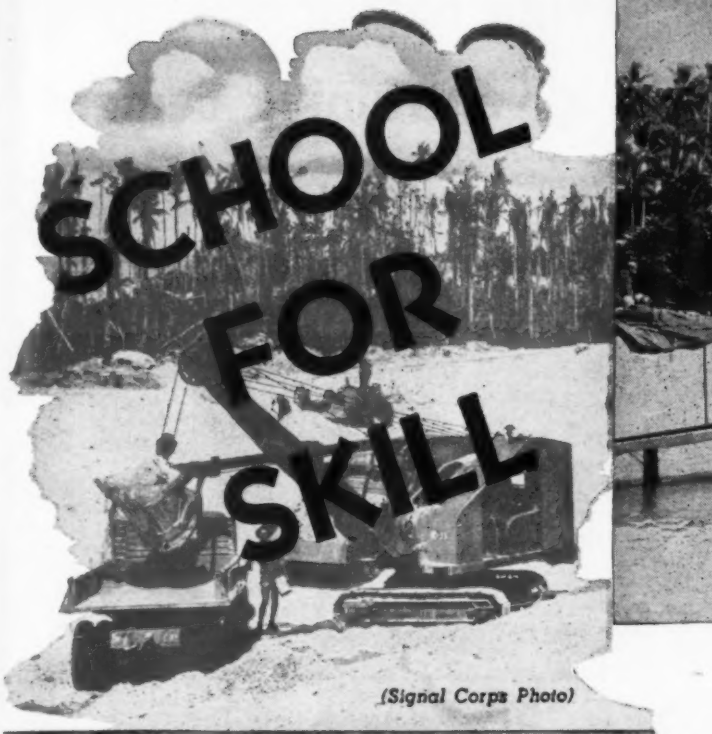
Applied early in a storm, Rock Salt prevents snow from packing and bonding to the pavement — makes complete removal fast and easy. Keeping pavements *completely* free of snow and ice means real safety.

"AUGER-ACTION" BORES IN



When ice has already formed, count on Sterling "Auger-Action" Rock Salt to bore right in and break it up. The model shows how the salt pellets bore right in, melt the ice and snow to form a brine which loosens the bond with the pavement. Removal by scraper is made easy.

STERLING *"Auger-Action"* ROCK SALT



(Signal Corps Photo)

SOUTH PACIFIC—A [illegible]
(Official Navy Photo)

ADAK—A 15-B crane erects a hangar.
(Official Navy Photo)

The men who are doing such an effective job of using today's fine excavators as weapons against the Axis, will be ready to apply their war-developed skill to the operation of tomorrow's better machines. The combination will make excavating a vital factor in building a **better** peacetime world.

As in war, Bucyrus-Eries, operated by war-trained men, will produce outstanding results on your postwar work.

V-60C

BUCYRUS ERIE

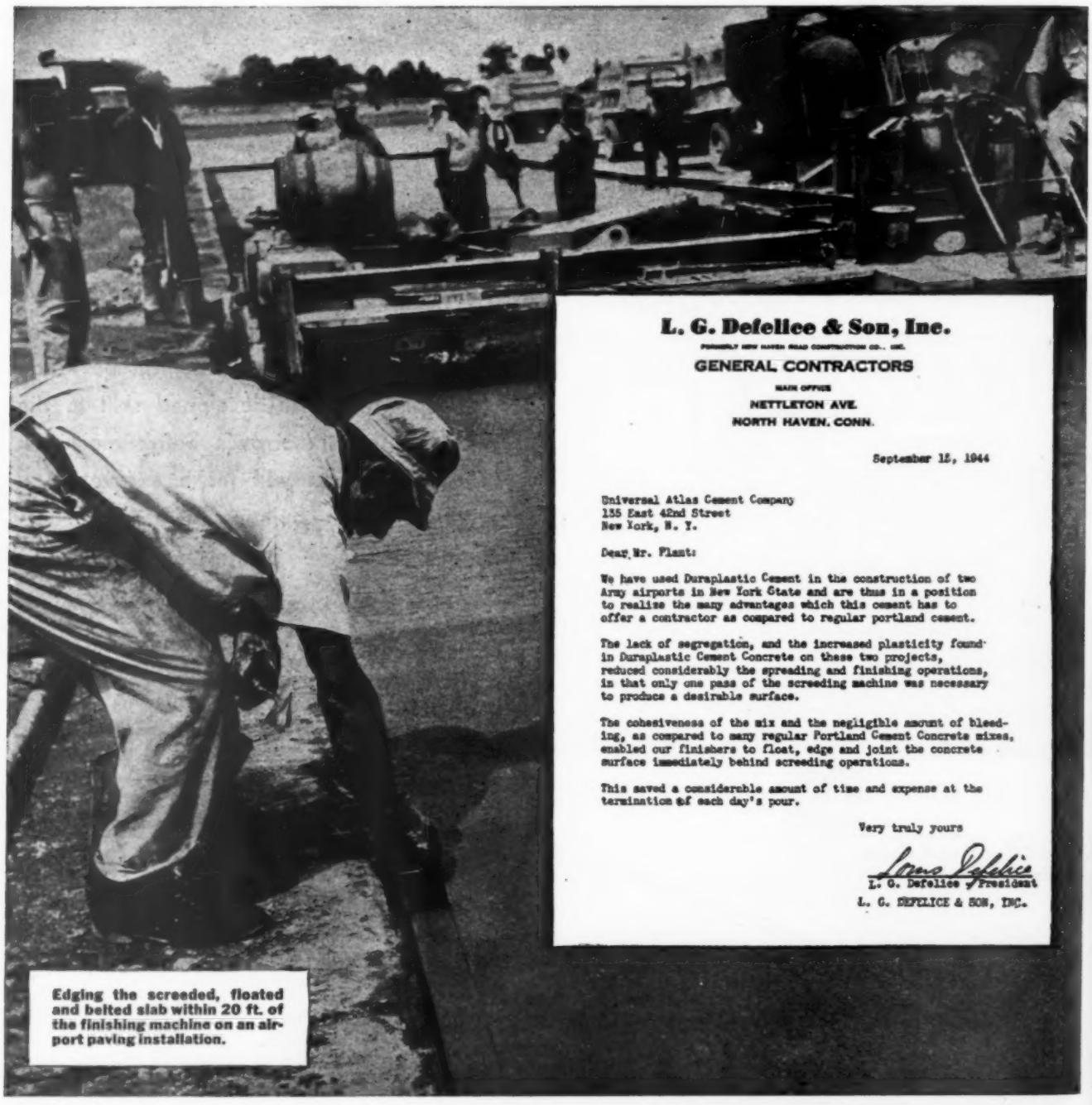
SOUTH MILWAUKEE, WISCONSIN

ALGIERS—A 10-B dragline widens a drainage ditch.
(Signal Corps Photo)

ALEUTIANS—A 15-B crane unloads supplies.
(Official Navy Photo)

Contractor speeds paving operations with Atlas DURAPLASTIC* air-entraining cement

Greater plasticity, lack of segregation and absence of bleeding save time on each day's operation



Edging the screeded, floated and belted slab within 20 ft. of the finishing machine on an airport paving installation.

L. G. Defelice & Son, Inc.

FORMERLY NEW HAVEN ROAD CONSTRUCTION CO., INC.

GENERAL CONTRACTORS

MAIN OFFICE

NETTLETON AVE.

NORTH HAVEN, CONN.

September 12, 1944

Universal Atlas Cement Company
135 East 42nd Street
New York, N. Y.

Dear Mr. Plant:

We have used Duraplastic Cement in the construction of two Army airports in New York State and are thus in a position to realize the many advantages which this cement has to offer a contractor as compared to regular portland cement.

The lack of segregation, and the increased plasticity found in Duraplastic Cement Concrete on these two projects, reduced considerably the spreading and finishing operations, in that only one pass of the screeding machine was necessary to produce a desirable surface.

The cohesiveness of the mix and the negligible amount of bleeding, as compared to many regular Portland Cement Concrete mixes, enabled our finishers to float, edge and joint the concrete surface immediately behind screeding operations.

This saved a considerable amount of time and expense at the termination of each day's pour.

Very truly yours

Louis Defelice

L. G. Defelice, President

L. G. DEFELICE & SON, INC.

ATLAS DURAPLASTIC CEMENT

A Universal Atlas Product

R5-D-9

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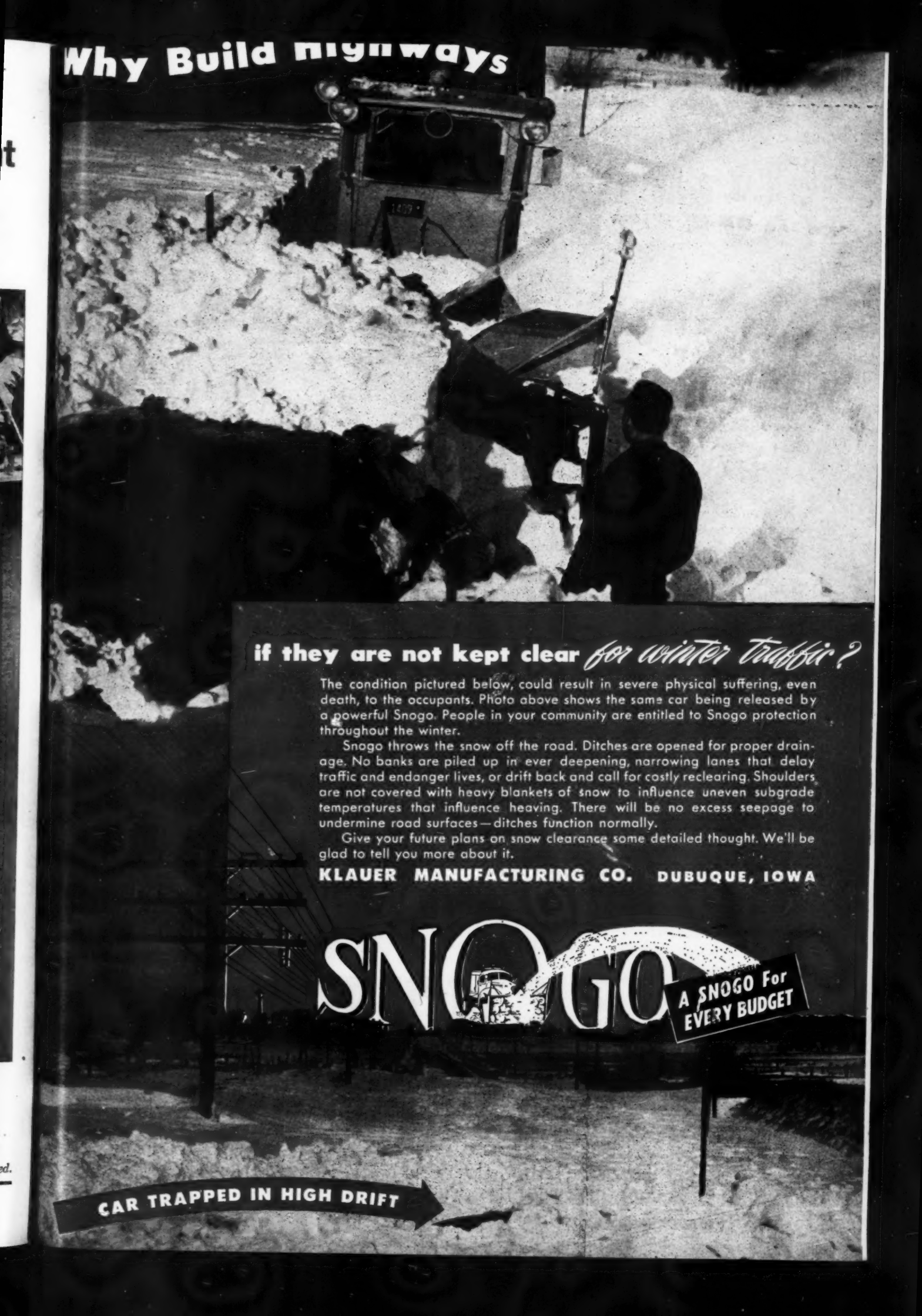

Why Build Highways
if they are not kept clear for winter traffic?
The condition pictured below, could result in severe physical suffering, even death, to the occupants. Photo above shows the same car being released by a powerful Snogo. People in your community are entitled to Snogo protection throughout the winter.
Snogo throws the snow off the road. Ditches are opened for proper drainage. No banks are piled up in ever deepening, narrowing lanes that delay traffic and endanger lives, or drift back and call for costly reclearing. Shoulders are not covered with heavy blankets of snow to influence uneven subgrade temperatures that influence heaving. There will be no excess seepage to undermine road surfaces—ditches function normally.
Give your future plans on snow clearance some detailed thought. We'll be glad to tell you more about it.
KLAUER MANUFACTURING CO. DUBUQUE, IOWA
SNOGO
A SNOGO For EVERY BUDGET
CAR TRAPPED IN HIGH DRIFT

HAVE THESE QUESTIONS PUZZLED YOU?

The men in our organization have been working under pressure for the past three years to build "Black Toppers" and Sanitary Street Flushers for our Armed Services and Allies. That the Army and Navy think we have done an excellent job is evidenced by the "E" Award. But meanwhile, there have been questions raised about our civilian production which you may be wondering about. And I wish to take this opportunity to end idle rumors and give you the true facts:

Is Etnyre too busy with war contracts to handle civilian orders?

No! In tooling up for greatly expanded war production of "Black Toppers" and Street Flushers, our capacity has been greatly increased. This fact, coupled with recognition by the war agencies of the need for equipment to build, maintain and clean roads and streets, has made it possible for Etnyre to make distributors and flushers for urgent civilian use even while deliveries are flowing steadily to the Armed Forces.

Can orders be placed now for Etnyre "Black Toppers" and Flushers?

Yes! Make application to your nearby Etnyre dealer or to us for complete information.

How about new models?

Battlefront operation gave Etnyre products the "acid test". We are proud to admit that Etnyre designs and construction stood up under the most grueling grinds of 24-hours-a-day operation for weeks at a stretch, in all climates of the world. Even so, from time to time improvements were made to simplify operation, incorporate new safety features, or increase efficiency. Today we are ready to build all of these tested features—both old and new—into Etnyre models.

Have Etnyre Spray-Bar patents run out?

No! Etnyre still holds U. S. patents on Spray-Bar design and construction which makes possible unequaled efficiency in the application of asphalt, cut-backs, tar, road oils and emulsion. Millions of gallons have been applied in years of black-topping service. Actually, these Spray-Bar design superiorities have been one of the big reasons why the Etnyre is the favorite of highway departments, contractors and operators. Infringements of these patents will be prosecuted.

Free **NEW BOOKLET ON POST-WAR ROAD BUILDING**

Get your free copy of this outstanding new booklet...statistics on road-building in the U. S. A. ...costs of construction and maintenance... charts on how a modern highway can be made to pay for itself in license fees and taxes. Write, wire, or phone for your copy today!

ETNYRE

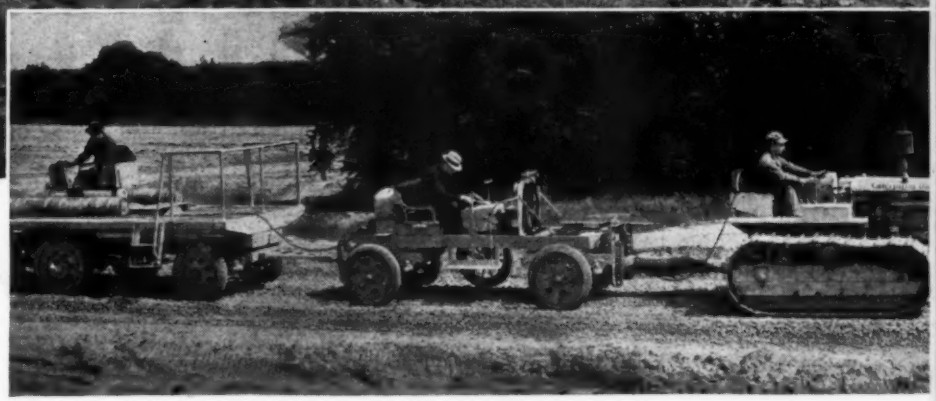
"Black Topper"

BITUMINOUS DISTRIBUTORS

E. D. ETNYRE & CO., MAIN PLANT AND OFFICE, OREGON, ILLINOIS, U. S. A.

PUTTING THE PROVE IN IMPROVEMENTS

• *This bucking bronco is a "Caterpillar" Diesel D2 Tractor taking one of the many "hurdles" that are designed to test its toughness on the "Caterpillar" Proving Grounds.*



• *A "Caterpillar" Diesel D4 Tractor pulling a drawbar dynamometer and loading car to test the pulling power of a certain grouser design in various kinds of soil surfaces.*

IF YOU'RE a long-standing "Caterpillar" Diesel user, you know that changes and improvements go into "Caterpillar" Diesel products the minute they're ready and right. There's no waiting for "yearly models."

Through the years, "Caterpillar" has given you such notable refinements as copper bellows seals for final drive, oil coolers, absorbent-type oil and fuel filters, finger-tip steering, "Hi-Electro" hardening for many vital parts, multi-speed transmissions and scores of others. Economy and dependability have been constantly improved. Only the basic design remains. It was *right* from the start.

Every improvement that has ever gone into a "Caterpillar" Diesel product has first been subjected to the stiffest laboratory and proving-ground tests that could be devised. The net result is Product Dependability. With every manufacturing step controlled by one organization in one factory, there can be no possibility of compromise with quality.

Dependability is the outstanding characteristic of "Caterpillar" dealers, too. Today they are in a position to give your "Caterpillar" Diesel equipment the kind of inspection, adjustment, maintenance and repair it needs to work at peak efficiency from now until Victory is won. Call on *your* "Caterpillar" dealer regularly.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

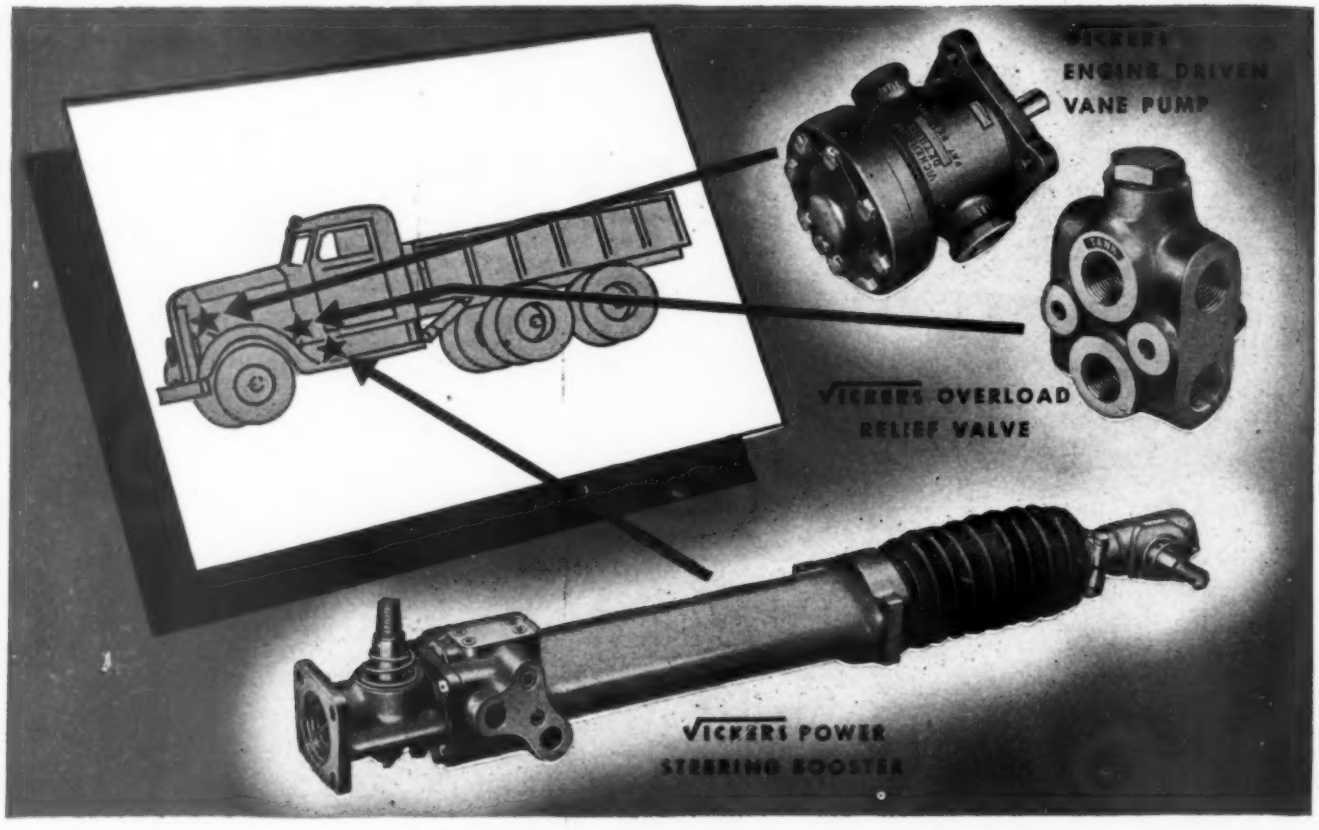
• • •

DEPENDABLE is the word for "Caterpillar" Diesel

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

TO WIN THE WAR: WORK—FIGHT—BUY MORE WAR BONDS!



EASY INSTALLATION . . . Another Feature of VICKERS HYDRAULIC POWER STEERING

Being compact and requiring a minimum of space for installation, the Vickers Hydraulic Power Steering System can be applied to most existing hand steering mechanisms with a few simple alterations. The separate and compact power cylinder (booster) can be located where it does not interfere with other apparatus and where the power will be applied directly to (and in line with) the drag link. No additional space is required at the end of the steering column where space is usually at a premium.

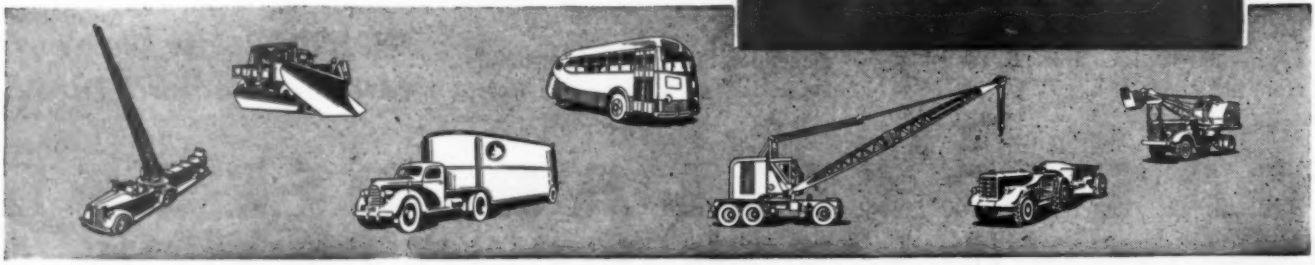
Other important advantages of Vickers Hydraulic Power Steering are: effortless, positive and shockless steering, automatic overload protection, reduced operator fatigue, greater road safety, automatic lubrication, and 14 years of operating experience. Bulletin 44-30 gives complete information about Vickers Hydraulic Power Steering; write for a copy.

VICKERS *Incorporated*

1432 OAKMAN BLVD. • DETROIT 32, MICHIGAN

Application Engineering Offices: CHICAGO • CINCINNATI • CLEVELAND • DETROIT
LOS ANGELES • NEWARK • PHILADELPHIA • ROCHESTER • ROCKFORD
TULSA • WORCESTER

Representative Applications of VICKERS HYDRAULIC POWER STEERING



A HIGH SPEED CRANE

Mounted on Pneumatic Tires
Operated by Air Controls

Owners and operators like the MICHIGAN for its handling ease and its quick convertibility to Clam, Dragline, Trench Hoe, and Shovel.

Two Sizes: 1/2 yard and 3/8 yard

MICHIGAN
POWER SHOVEL CO.
BENTON HARBOR, MICHIGAN

Asphalt resurfacing

—is a fast, low-cost method for restoring a long-wearing, smooth-riding surface to concrete, brick, or other worn or broken highways—including 4-lane trunk-lines—and city streets.

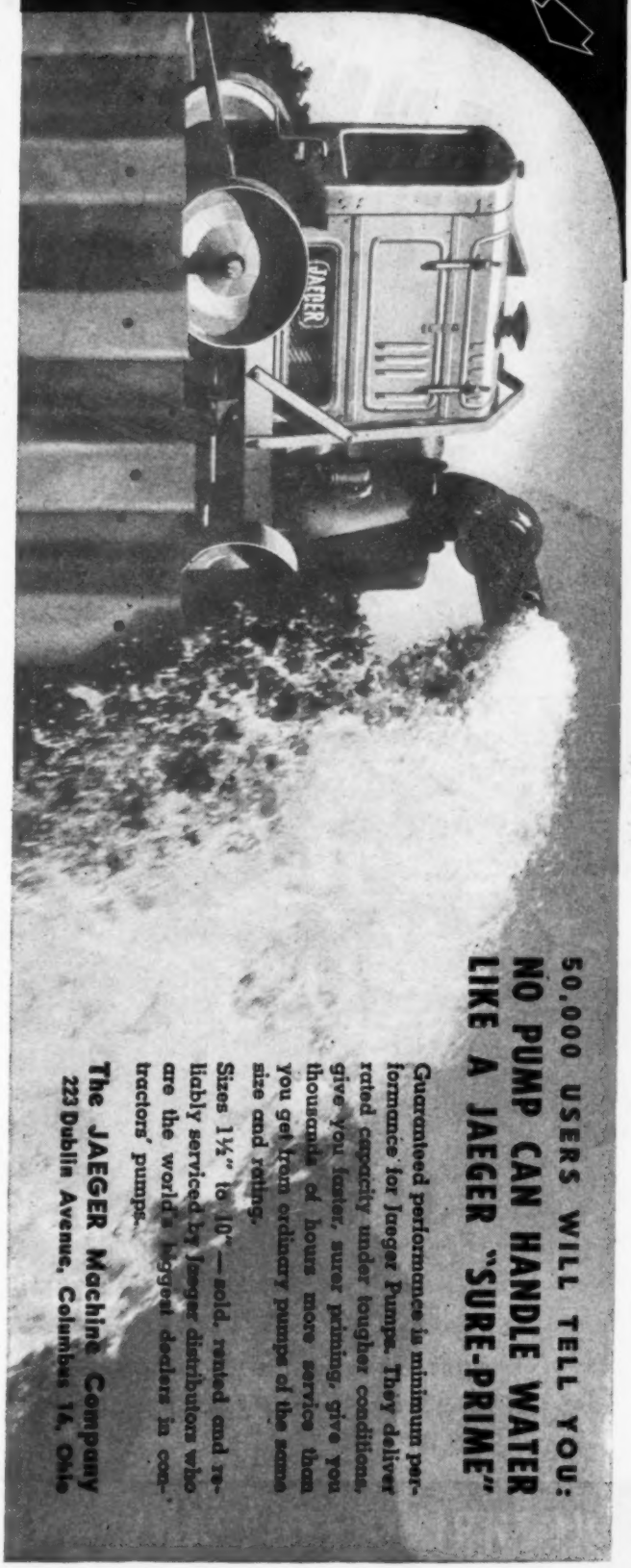
Plan now to get the most miles of improved roads from your next year's highway dollar with:

STANDARD OIL COMPANY (INDIANA)

ASPHALT PRODUCTS

910 S. MICHIGAN AVE. • CHICAGO 80, ILL.

If you have a WATER problem THIS PICTURE IS WORTH 1,000 WORDS



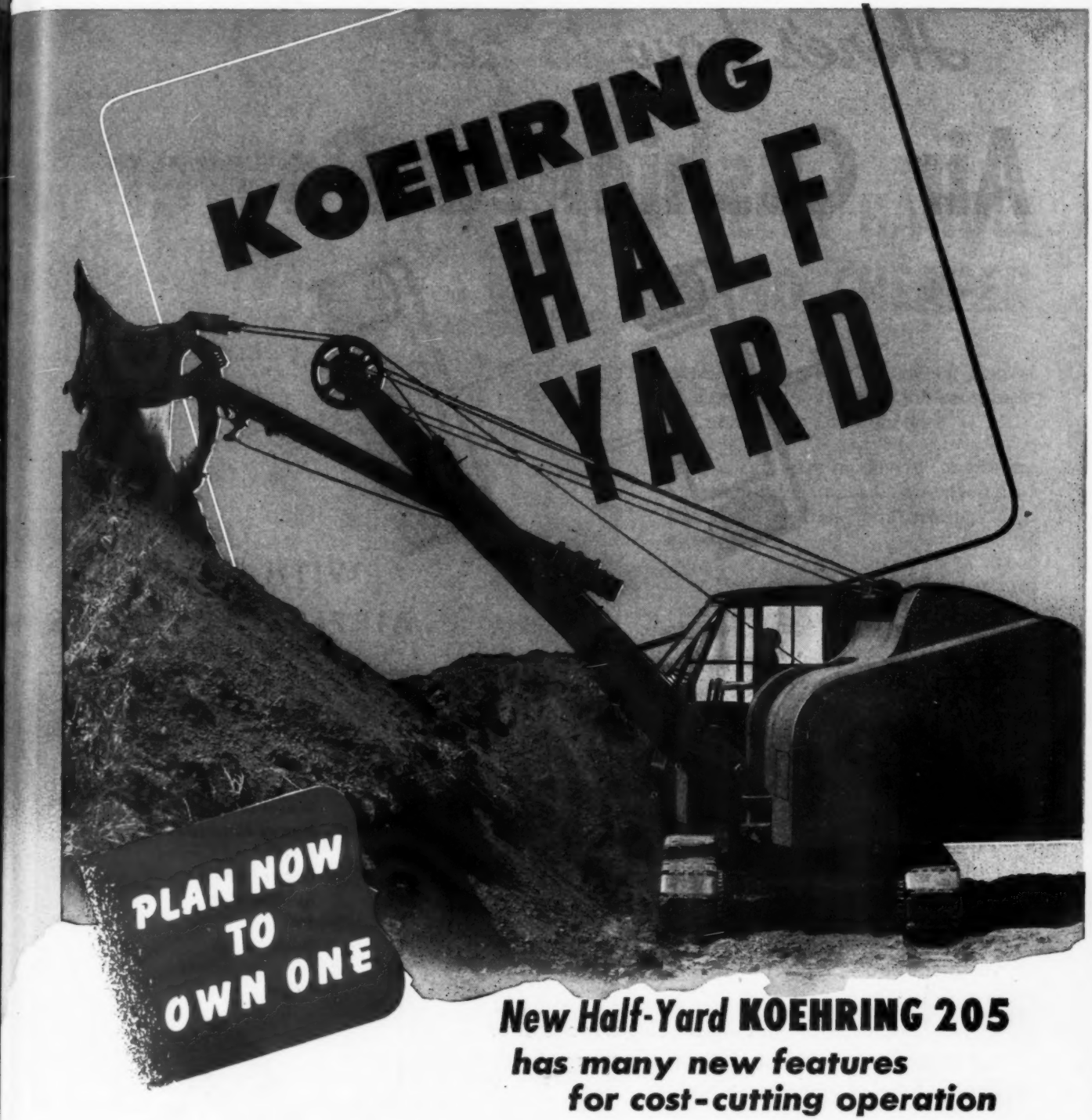
50,000 USERS WILL TELL YOU:
NO PUMP CAN HANDLE WATER LIKE A JAEGER "SURE-PRIME"

Guaranteed performance is minimum performance for Jaeger Pumps. They deliver rated capacity under tougher conditions, give you faster, surer priming, give you thousands of hours more service than you get from ordinary pumps of the same size and rating.

Sizes 1½" to 10"—sold, rented and reliably serviced by Jaeger distributors who are the world's biggest dealers in contractors' pumps.

The JAEGER Machine Company
223 Dublin Avenue, Columbus 16, Ohio

KOEHRING COMPANY • MILWAUKEE 10, WISCONSIN



New Half-Yard KOEHRING 205
has many new features for cost-cutting operation

Two-In-One Shovel Boom • Trigger Fast Dipper Trip • Clear Interior Turntable • Independent Traction • Spacious Walk-Around Area • Exceptionally Accessible Machinery • Head Room in All Parts of Cab • Easily Removable Machinery Units • Two Purpose Main Machinery Support • Exceptional Steadiness • Instant Travel Reverse.

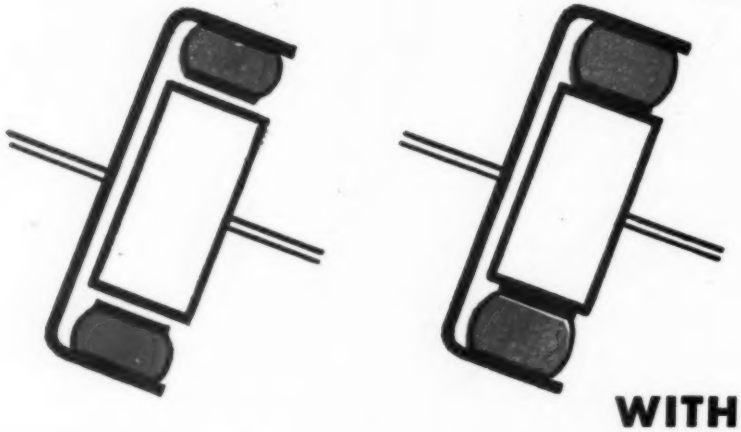
KOEHRING HEAVY DUTY

ARMY E NAVY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

Here's how to get

Air Cushioned Power



WITH FAWICK AIRFLEX CLUTCHES

Simple — positive — trouble-free. You inflate that rubber-and-fabric air gland of the Fawick Airflex clutch and you get instant clutch engagement, as firm or as light as the job demands. Deflate and the clutch runs free.

And more! Shocks and vibration are absorbed by a cushion of air. Smooth starts and stops. No moving parts — no springs, arms or levers. No adjustments to make — no lubrication required. Maintenance costs low. Performance and dependability are proved on thousands of naval vessels and on heavy machinery drives throughout industry.

Why not write to our Engineering Department for recommendations based on experience with heavy-duty clutches?

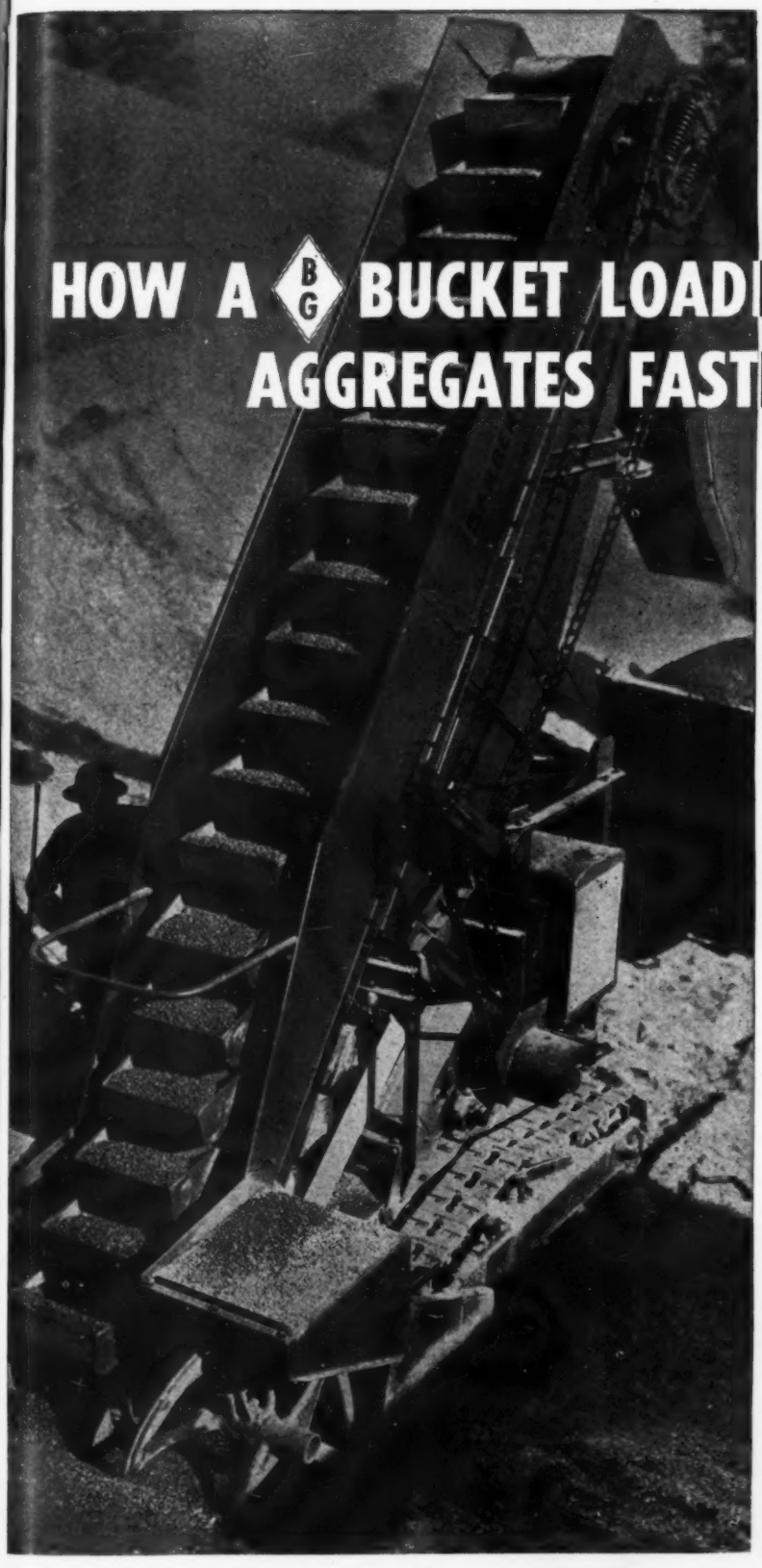
PERFORMANCE PROVED for

Diesel Drives
Heavy Machines
Drags and Cranes
Paper Mills
Rubber Mills
Steel Mills
Mine Hoists
Oil Field Drives
Sugar Mills

FAWICK AIRFLEX COMPANY, INC.
9919 Clinton Rd. • Cleveland 11, Ohio
In Canada, **Ronald-Coventry Ltd., Montreal, Toronto, Vancouver**
In Britain, **Crofts Engineers, Ltd., Bradford, England**

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR



HOW A B-G BUCKET LOADER HELPS HANDLE AGGREGATES FASTER AND CHEAPER

THIS versatile Barber-Greene Bucket Loader is a valuable job-coordinating unit in pit and quarry.

You can save money by processing aggregate at a uniform rate, even during "off" seasons, and storing it in stockpiles.

A Barber-Greene will reload it into trucks, whenever needed, at exceptionally low cost. In fact, many operators have found that the saving in truck time alone justifies its purchase.

Continuous handling by the B-G Loader is extremely advantageous in feeding material to processing equipment — screens, crushers, belt conveyors.

The B-G Bucket Loader also can be used for stripping, light excavating, screening, and many other cost-saving applications.

Full crawler mounting, tank type chassis, automatic overload release, synchronized spiral feeding, floating boom, centralized control, and 12 crowding speeds are but a few of the advanced mechanical features that give the B-G Loader long life and fine performance under the rigors of heavy, steady work. Consult your B-G representative or write the Barber-Greene Company, Aurora, Illinois.

44-28

Barber-Greene B G *Constant Flow Equipment*

AS LONDON STOOD AGAINST BOMB HAVOC

Death and destruction from the skies found Britain firm. Bombs exploding outside St. Paul's Cathedral could not shake British resolution. The Luftwaffe was beaten and the Invasion was begun. With D-Day near, St. Paul's filled. Prayers rose from the ancient stone floor to be swiftly answered by the liberation of France.

International Trucks like those used by America's construction industry helped clear the destruction wrought on London. These Internationals are rugged trucks, powered by the famous International Red Diamond Engine. They demonstrate in London, as in America's construction industry, International standards of stamina, dependability and ease of operation . . . standards that explain why more International Heavy-Duty Trucks were sold in the 10 years before the War than any other make.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

Photograph published by special permission of the London County Council.

Pledged U.S. TRUCK CONSERVATION CORPS

New Trucks: The government has authorized the manufacture of a limited quantity of trucks for essential civilian hauling. International is building them in medium-duty and heavy-duty sizes. See your International Dealer or Branch for valuable help in making out application.

INTERNATIONAL

INTERNATIONAL *Trucks*

EFFICIENT for SHORT and LONG HAULS

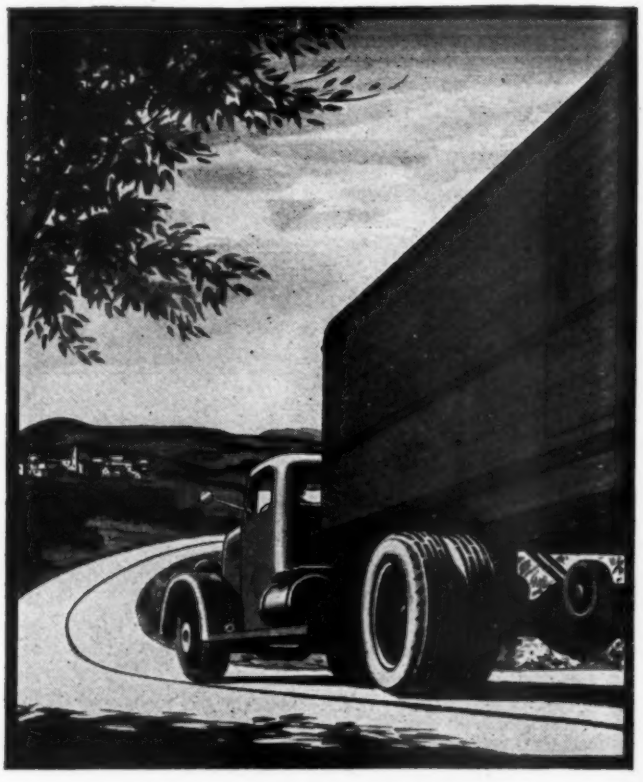
WHETHER your contract is large or small, the hauls short or long, Euclids will do the job faster at lowest cost per yard. Their overall speed, efficiency and large capacity have cut hauling costs for hundreds of contractors and industrial users on all types of off-the-highway jobs.

With modern loading equipment and Rear-Dump or Bottom-Dump EUCLIDS you can handle all kinds of excavation at lower cost than with other types or combinations of earth moving equipment. Check Euclid operation on any job for proof that they are efficient for all lengths of haul. Your Euclid distributor or representative is at your service to provide helpful facts and figures.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLID SELF-POWERED HAULING EQUIPMENT
For EARTH . . ROCK . . COAL . . ORE

For a Quick Recovery



"Quick Recovery" is the job of the Heavy Wreckers built by Ward LaFrance for the armed forces. When a tank, truck, or half-track is put out of action, these rugged trucks go out and get them. They bring 'em back through sand, muck and rocky terrain, over nearly impossible trails or, often enough, cross country.

Using this equipment, a Rigger-Wrecker graduating class at the O.R.T.C., Aberdeen Proving Ground, hung up an unchallenged speed record by recovering an overturned five-ton truck from a deep ditch in three minutes and 28 seconds, under simulated battle conditions.

If your fleet has suffered from lost tonnage due to wartime lack of trucks, Ward LaFrance trucks are the best prescription for quick postwar recovery. Whether your needs call for dump trucks, over-the-road tractors (gasoline or Diesel), or vehicles engineered to your individual needs, Ward LaFrance offers your best profit opportunity: . . . A plan developed particularly for fleet owners makes it possible for you to take full advantage of the rugged power and dependability of Ward LaFrance trucks on a basis which will cut the cost of transportation to the bone.

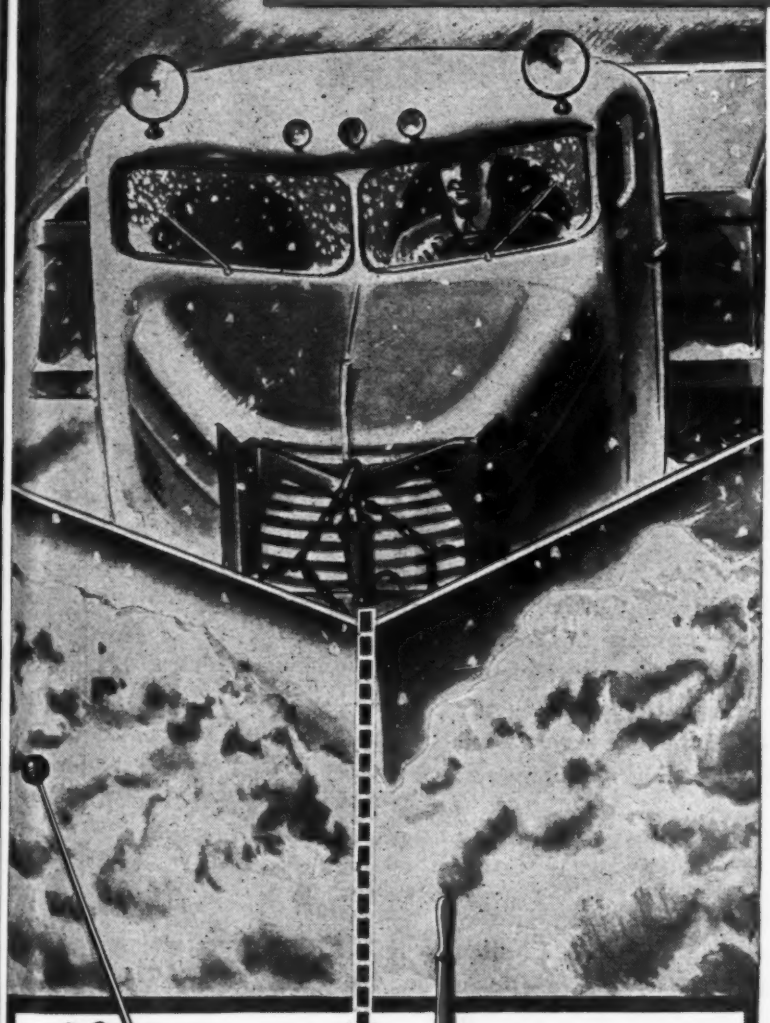
WARD LAFRANCE

TRUCK DIVISION

GREAT AMERICAN INDUSTRIES, INC.

ELMIRA, NEW YORK

Let BLACKHAWK Help You *Blitz* the *Blizzards*



BRING your snow-removal equipment up-to-date with inexpensive, easy-to-install Blackhawk Hydraulic Controls. Raise and lower the snow plow with Blackhawk Hydraulic Power, controlled by the operator from his cab. Hand or power-operated Blackhawk Hydraulic Pumps can be supplied, with standard valves and rams to meet your needs.

Make your present equipment safer and easier to operate. Modernize it the Blackhawk Way. For complete information, write your equipment manufacturer—or write us direct. And, when ordering new equipment, be sure to specify Blackhawk Hydraulic Controls.

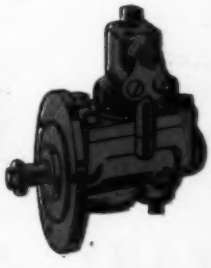
A Product of **BLACKHAWK MFG. CO.**
Dept. RS, MILWAUKEE 1, WIS.

P-60 HAND-OPERATED, stationary-type pump.

The V-15 VALVE --for remote control of rams operated by a power-driven pump.

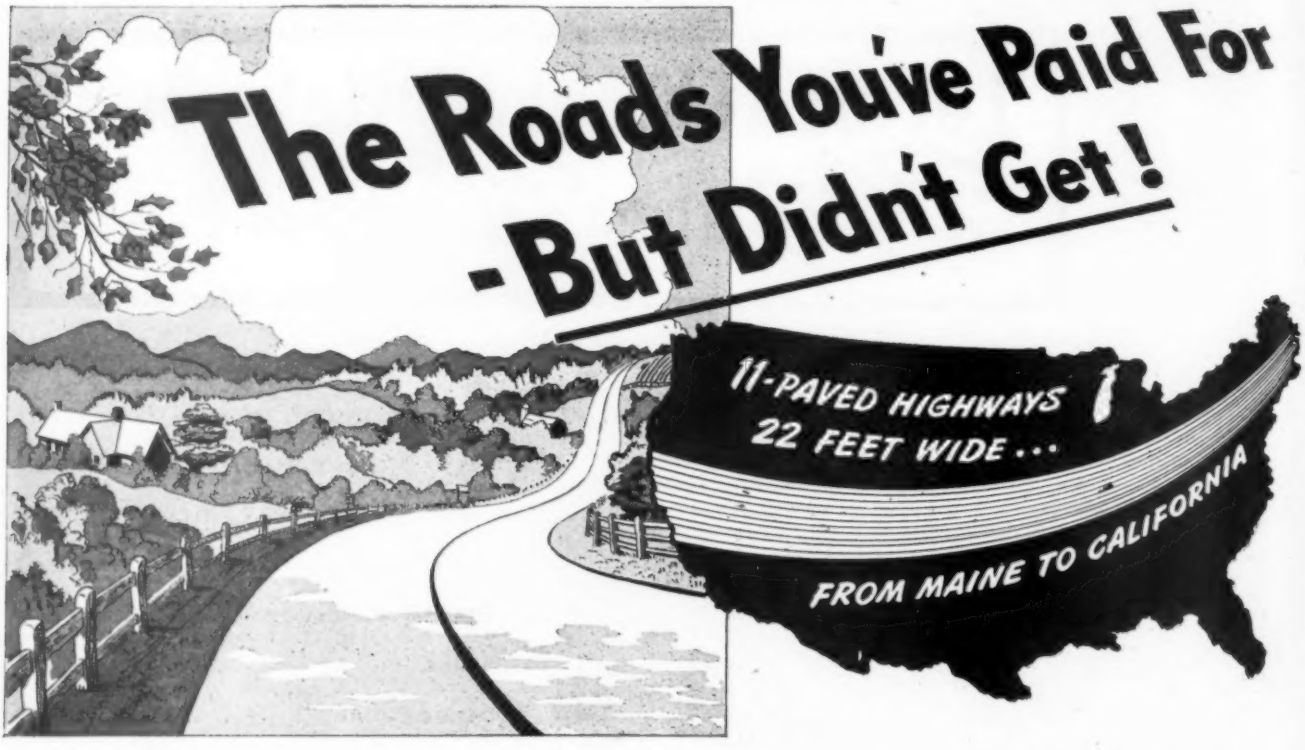
A COMPLETE RANGE OF RAMS is available for snow-plow service.

P-104 POWER-DRIVEN PUMP. Operates from fan belt or crank shaft.



BLACKHAWK
Hydraulic Equipment

[*This message is appearing in a number of National Publications in the public interest and as a service to the Motor Transport Industry*]



TAXES USED
for Other Purposes

When you start talking figures these days, a sum like $1,555,002,000 doesn't sound so big. But, you may be surprised to hear that this amount would pave eleven 22-foot concrete highways from Maine to California!

This 1½ billion dollars is the total of your **highway tax money** which was allocated by State agencies for purposes **other than road building and upkeep** from 1934 through 1942.

Just think of the new highways which **could have been built** . . . the narrow pavements which **could have been widened** . . . the grade separations and other safety improvements which **could have been paid for with this sum!**

FUNDS *Raided*

But, instead, these billion and a half dollars have been allocated to financing unemployment . . . relief costs . . . and other miscellaneous purposes which are entirely foreign to highway construction and maintenance.

No one will argue, perhaps, that some of the projects this money supported were not worthy, but the fact remains that **the taxes you pay for the use of the highways should be expended solely for highways!**

ARE YOUR HIGHWAY TAXES *Too High?*

Since you and all other highway users have paid more than a billion and a half dollars for roads you didn't get, doesn't it seem logical to assume that either — **(1) the taxes on all motor vehicles are too high, or (2) highway building, maintenance and safety programs are being sacrificed?**

15 STATES *Protect* THE TAXPAYERS

To date, 15 States have put a stop to this dipping into highway tax money for unrelated purposes by passing constitutional amendments outlawing such action. Perhaps you live in one of these States . . . California, Colorado, Idaho, Iowa, Kansas, Michigan, Maine, Minnesota, Missouri, Nevada, New Hampshire, North Dakota, Oregon, South Dakota or West Virginia. Kentucky, Nebraska and Washington are expected to join this group.

HOW TO GET THE HIGHWAYS *You Pay For!*

However, if you live in any of the other 30 States (except Louisiana, Kentucky and Iowa) your State Legislature will meet in regular session early in 1945. This, then, is the time to insist that your Legislators take action to safeguard *your* highway tax money. Such action will guarantee either — **(1) better and safer highways, or (2) a reduction in your highway taxes.**

World's Largest Builders of Truck-Trailers *Service in Principal Cities*

FRUEHAUF TRAILER COMPANY • DETROIT 32

3/4¢

ON A 23 FOOT SUBGRADE

The economy achieved by the use of a STANDARD-LEWIS Subgrader is quickly seen in the report from one contractor (name on request). He writes that the total subgrading cost was only ¾ cents per square yard on a 6 mile paving job. The same economical operation can be yours. And added to this, the following unique features make this subgrader a "natural" for you.

The STANDARD-LEWIS Subgrader is designed with a sectional stationary cutting blade (adjustable to any desired subgrade contour) on each side so that grading may be done in either direction without turning machine, or time consuming "pull backs." It can be raised by power to pass over manholes, culverts and other obstructions while in operation. Wheels may be turned 90° to permit towing by truck or tractor over bridges or through narrow places. Many other features make it the one subgrader designed to meet post-war requirements for better, faster paving.

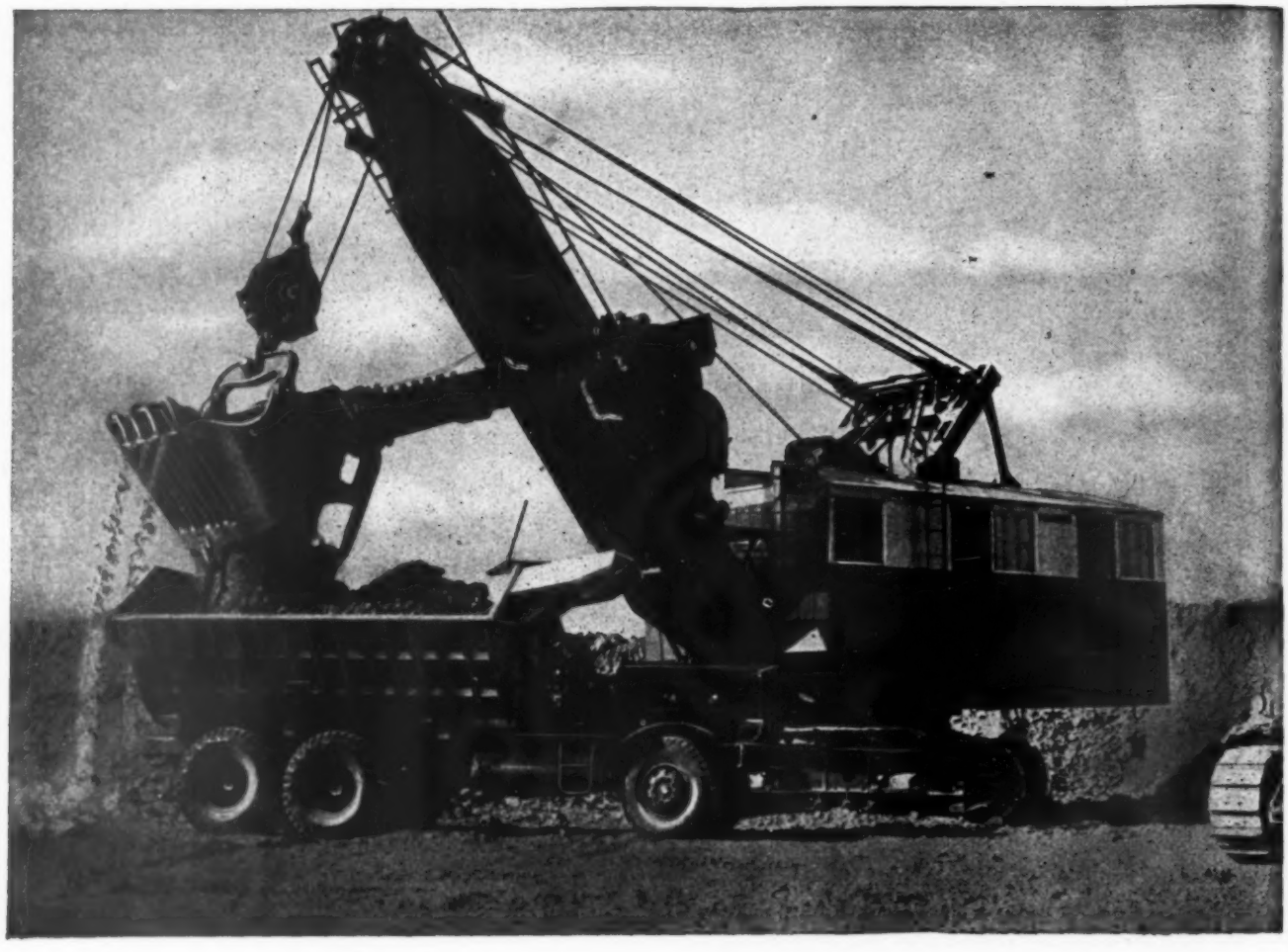
OTHER STANDARD PRODUCTS

ASPHALT PLANTS • BATCHING PLANTS • ASPHALT FINISHERS
CONCRETE FINISHERS • LOADERS • ROLLERS • POWER BROOMS

STANDARD
STEEL CORPORATION

General Offices and Plant: 5001 South Boyle Avenue
Los Angeles 11, California
Distributors Throughout United States and Canada

BETTER *Lubrication* Means Better Maintenance



Is difficult maintenance a problem? Maybe excessive wear due to inefficient lubrication is the cause. That's where Sinclair Lubricants can help.

SINCLAIR PENNSYLVANIA and OPALINE MOTOR OILS have the tough film strength that holds down engine wear, lay-offs and replacements.

Sinclair specialized gear lubricants and greases are highly efficient under all conditions. Sinclair TEN-OL 200 provides better lubrication for hard-worked Diesel-powered equipment.

• • •

(Write for "The Service Factor"—published periodically and devoted to the solution of lubricating problems.)

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Grading a street underpass in Los Angeles, California.

Model T4 covering new pavement for cross road traffic. U. S. Highway 30 near Wanatah, Ind.

Loading out old pavement and grading for new — Oakland, Cal.

PUT TRAXCAVATORS on the job! Whether building or maintaining roads and streets, they're the all-purpose machines that do more work on every job—with worthwhile savings in time, labor, and money. Stripping and loading old pavement, preparing subgrades, widening shoulders, clearing right-of-way, charging crushers and mixers, hauling; snow plowing, snow shoveling are only a few of the jobs versatile TRAXCAVATORS perform in road, street, and park service. Powered by "Caterpillar" track-type tractors, these powerful, compact, easy-to-handle, multi-purpose machines are real masters of the road. Highly mobile, TRAXCAVATORS travel around jobs at tractor speeds. Easily transported on streets and highways. Your Trackson-"Caterpillar" dealer has the fact-full TRAXCAVATOR story for you. Or, write for informative literature to TRACKSON COMPANY, Milwaukee 1, Wis.

One of Ft. Mill, S. C. township's two T4's. "A necessity for better roads... we wouldn't be without our T4's," says J. O. Hammond, Commissioner.

The illustrated booklet, "Excavating with TRAXCAVATORS," shows graphically why TRAXCAVATORS can do more work on more jobs. Send for it, today.

TRAXCAVATOR

The Original Tractor Excavator

Soil-cement on Frothingham St., in Lowell, Mass., which has over 13 miles of such modern paving. Picture taken September, 1944, shows why property owners are pleased with this prewar improvement program.

Johnsonville, S. C. road, first scientifically controlled soil-cement paving built in the United States. Recent picture shows road continuing to give fine service after nine years.

Soil-Cement

For Secondary Paving Programs

DEPENDABLE • ECONOMICAL

More than 37 million square yards of Soil-Cement paving in all parts of the United States is rendering economical service on light traffic roads, streets and secondary airports. It provides continuous, all-weather service at low annual cost.

Construction economy is inherent in Soil-Cement paving because it is about 90 per cent existing roadway material. Hauling and material costs are reduced to minimum.

Simplicity of construction results from easy mixing and dependable control of cement, moisture and density.

The superior value of Soil-Cement for secondary paving is demonstrated by its service record and by comparison with the cost and service of other types intended for the same purpose.

Make Soil-Cement the basis of your secondary paving program. Ask our engineers to help you on detail plans. Specific information on request.

Soil-Cement is ideal for new construction or for rebuilding and improving old granular-type secondary roads, streets and runways such as sand-clay, clay-gravel, crushed stone, gravel, lime rock, caliche or shell.

PORTLAND CEMENT ASSOCIATION

Dept. 11-28, 33 West Grand Ave., Chicago 10, Illinois

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work

BUY MORE WAR BONDS

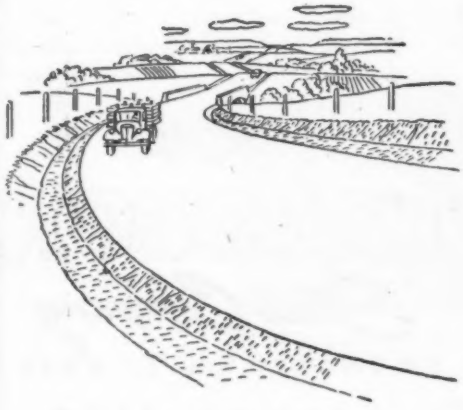
LET'S HELP PROVIDE JOBS!..

It's up to Us in the Highway Industry to help ward off a Breakdown of our Peacetime Economy

MR. CONTRACTOR . . Is your present equipment in condition? Could you put it to work . . . NOW? Have you talked to your dealer about additional units?

MR. ROAD OR STREET OFFICIAL . . Are your plans ready for bids? Can you start the ball rolling in your community without a moment's delay? YOU are the *key man!*

AS YOUR MANUFACTURER . . As one of your suppliers of construction machinery, we are happy to say we will have a wider and better line of units than ever before. Our plans for peacetime expansion have been made. As rapidly as the fortunes of war permit, you will get those powerful, fast-moving 2-cycle Diesel tractors with bulldozers and scrapers . . . motor graders, power units and other necessary tools — proved and improved by the rigors of war. But, as you would want it, until the war is unconditionally won in every theater, Allis-Chalmers will produce every machine possible to attain that end. Our policy is to "Work For Victory . . . and Plan For Peace!"



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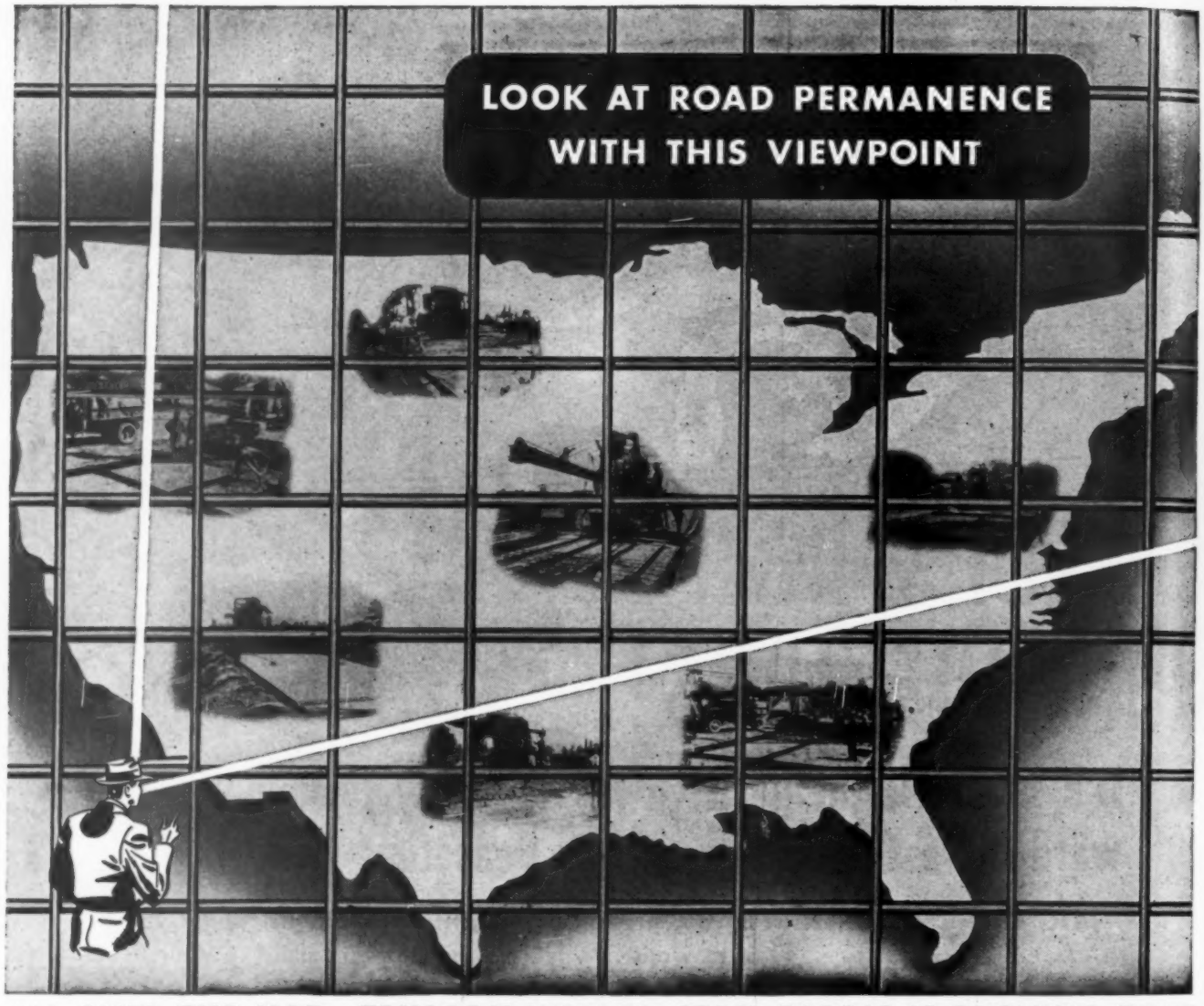
ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.



ALL OVER THE MAP—TRUSCON WELDED STEEL FABRIC IS PROVING THAT

Steel Builds Roads that Endure!

Steel and concrete have proved their special worth in millions of miles of highways. At every point of the compass . . . under every conceivable condition of weather . . . Truscon Welded Steel Fabric Reinforcement, and other specialized Truscon roadbuilding products, are assuring long-life concrete pavements.

Engineers and designers have found by experience, practice and research that the following advantages can be expected from Truscon Welded Steel Fabric Reinforcement:

Provides resistance to cracking due to shrinkage of concrete during setting period.

Provides tensile strength necessary to resist subgrade friction caused by expansion and contraction of the concrete slab due to temperature changes.

Provides increased resistance to cracking of concrete due to warping under load.

Provides resistance to the development of microscopic cracks into visible cracks.

Provides resistance to cracks opening and allowing the entrance of water.

Provides resistance to broken ends of slabs separating at a crack.

Decreases spalling and progressive disintegration of the concrete.

When you plan roads, plan them well. Use structural designs that have been proved the most economical, durable and serviceable in the *long run.* Use Truscon Welded Steel Fabric with other associated Truscon roadbuilding products, and assure lasting prestige for you and more permanent highways for the communities you serve.

ARMY E NAVY

TRUSCON
Steel Company
YOUNGSTOWN 1, OHIO

SUBSIDIARY OF REPUBLIC STEEL CORPORATION

One name stands out

PIONEER

From the day when the first Pioneer Portable gravel plant was towed to a road-side pit to produce aggregate for Wisconsin's specifications, one name has stood out. In pit, quarry and mine you see the name Pioneer on gravel plants, washers, crushers, screens, conveyors, bituminous plants. Pioneer leads in the qualities that make equipment pay.

Pioneer stands for sensible, simple engineering—design that meets the job requirements—rugged construction for rugged work—low maintenance costs.

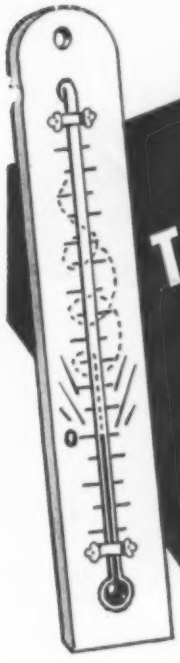
That these dependable qualities are present in greater measure in Pioneer equipment is manifest by the many contractors who year after year have relied exclusively on Pioneer.

Pioneer is proved equipment — and the right combination of Pioneer units will make more money for you. Pioneer engineers are ready to help you now.

Pioneer
ENGINEERING WORKS

ENGINEERS and MANUFACTURERS of QUARRY · GRAVEL AND MINING MACHINERY

MINNEAPOLIS 13, MINNESOTA



TUMBLING THERMOMETER TIME IS HERE!

A partial check-list of Cleaver-Brooks equipment for cold weather construction and maintenance!

DESPITE cold and wet weather, construction and maintenance work must go on.

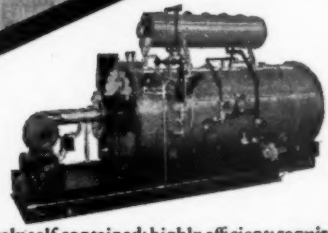
Cleaver-Brooks equipment provides steam, heat or hot water — fast, efficiently and at low cost — for a wide range of cold weather needs, such as—

- heating asphalt, road oils, bituminous materials in tank cars and storage tanks.
- heating water for central mixing plants.
- thawing and heating aggregate in stock piles or bins — for winter concreting.
- steam for cleaning machinery, thawing frozen ground, operating steam hammers, heating buildings and offices, and other uses.

Write for bulletins and complete information on the entire line of Cleaver-Brooks equipment for cold weather construction and maintenance.

CLEAVER-BROOKS COMPANY
5106 North 33rd Street • Milwaukee 9, Wisconsin

AUTOMATIC STEAM PLANTS



Completely self contained; highly efficient; require only simple piping connections to place in operation. Fully automatic fuel-oil burner; condensate recovery and feed water pumping system; no stack needed, sizes ranging from 20 to 500 h. p.; pressures 15 to 200 lbs.

HOT WATER BOOSTERS

Oil-fired; fully automatic or manual operation; no licensed engineer needed to operate; two capacity sizes: 3000 gals. storage tank providing 1600 gals. of water heated 150° F. per hour; 1500 gals. storage tank providing 800 gals. of water heated 150° F. per hour.

PORTABLE PUMPING BOOSTERS

Heats bituminous material by direct firing in one operation, loading directly to distributor, relay truck or returning to tank car. Built in two sizes, truck mounting or 4-wheel trailer.

PORTABLE TANK-CAR HEATERS

Available in 2 and 3 tank-car sizes. Oil-fired with exclusive four-pass flue travel; dry-coil steam condensate return under pressure — no water or heat loss. An all-purpose unit — provides a portable source of steam wherever needed.

Cleaver-Brooks

PIONEERS AND ORIGINATORS OF

TANK CAR HEATERS . . . BITUMINOUS BOOSTERS . . . AUTOMATIC STEAM PLANTS

- ☆ Bucket Teeth, Lips and Runners
- ☆ Bucket Sides and Bottoms
- ☆ Latch Pins
- ☆ Boom Sockets
- ☆ Track Rollers
- ☆ Track Tumblers
- ☆ Track Pads

Here are important shovel-saving applications for STOODY SELF-HARDENING

BUCKET TEETH AND LIPS

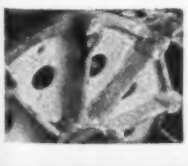
Stoody Self-Hardening is generally applied on teeth and lips as stringer beads. When working in heavy rock or under similar conditions, beads running parallel to the flow of material withstand terrific shock and provide wear resistance comparable to solid deposits.

BUCKET SIDES AND BOTTOMS

Note the crossed stringer beads forming checkerboard patterns. Areas between beads tend to fill and pack with the material being worked, preventing direct abrasion against metal bottom or sides beneath. Checkerboard patterns are particularly adapted to looser types of formations.

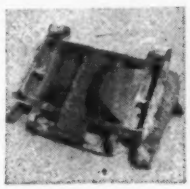
TRACK ROLLERS

A single pass of Stoody Self-Hardening around convex surface of worn track rollers generally restores original size, keeps shovel weight on rollers rather than permitting it to be gradually lowered on driving and idler tumblers. Grinding of rollers after hard-facing is unnecessary.



TRACK TUMBLERS AND IDLERS

If wear is not abnormal, bring lugs to size with Self-Hardening alone. Sufficient accuracy can be attained in size by comparing to unworn sections. Rebuild flat spots on idlers, then hard-face with a single layer of Stoody Self-Hardening.



TRACK PADS

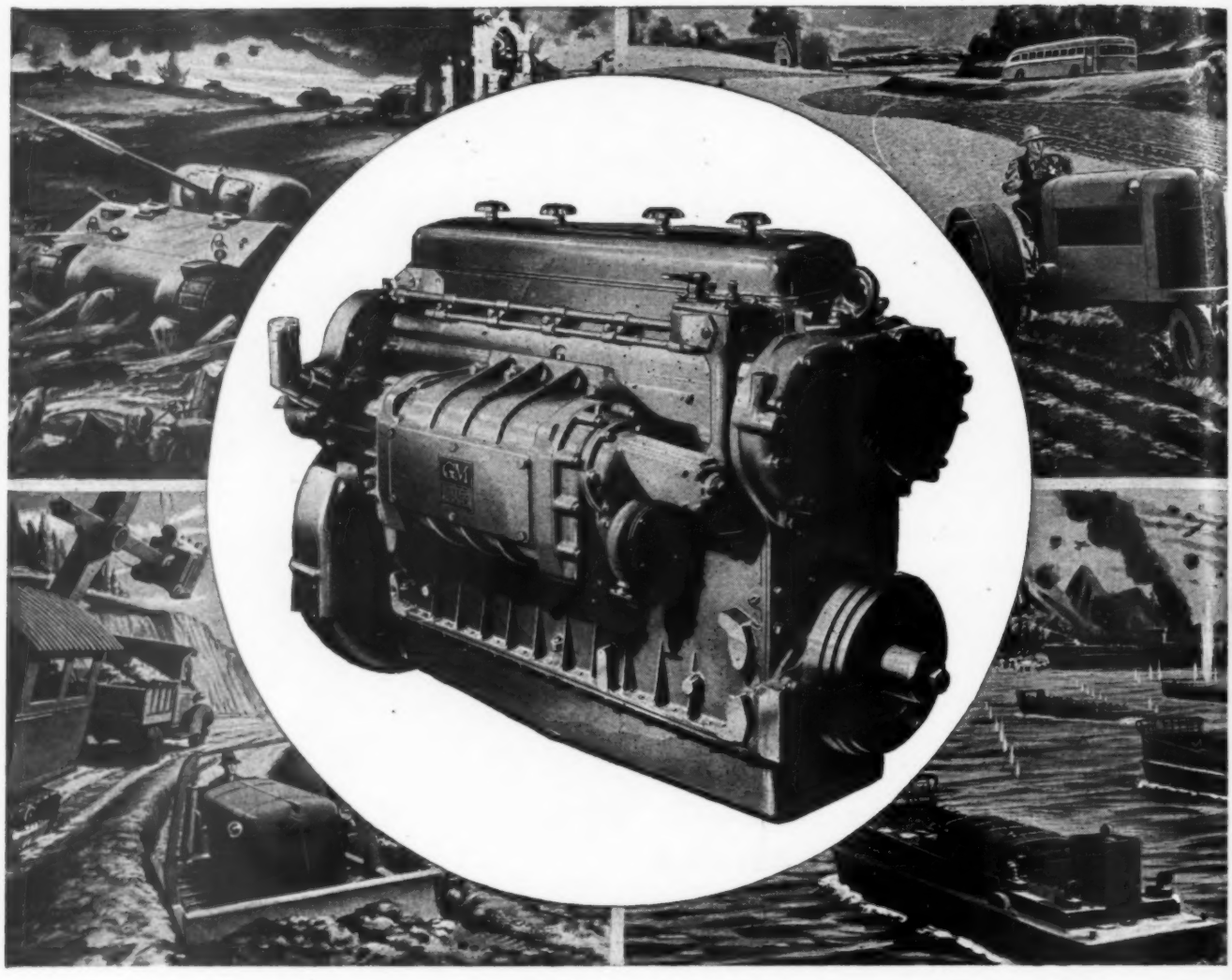
Hard-face leading and trailing edges and inner surfaces of pad lugs with Stoody Self-Hardening, as well as the concave section on which rollers travel. When reassembling, insert new, rebuilt or oversize pins to take up any lengthening of track due to pin wear. This insures accurate mesh between tumbler and pad lugs, and lowers wear.

STOODY SELF-HARDENING, today's number one weapon against wear, is specially suited for hard-facing wearing parts on many types of heavy equipment. Why? Because it forms an excellent bond with manganese steels, provides at least double the wear resistance, yet resists chipping under heavy impact. You'll save your equipment, eliminate down-time and keep things rolling longer by specifying Stoody Self-Hardening for hard-facing wearing shovel parts. More information on earth-working equipment applications is contained in "Stoody Specification Sheets." These describe heavy equipment applications in detail and furnish invaluable information regarding method of application, additional life of hard-faced part and illustrate appearance of correctly applied hard surfacing. Ask for your free copy.

*Stoody Self-Hardening is one of 12 Stoody hard-facing metals especially alloyed to combat abrasive wear with its many variable combinations of heat, impact and corrosion. A booklet covering all Stoody alloys with a non-technical discourse on their individual properties will be mailed free.

STOODY COMPANY
1125 WEST SLAUSON AVENUE, WHITTIER, CALIFORNIA

STOODY HARD-FACING ALLOYS
Retard wear . . . Save Repair



GM DIESELS SERVE WHEREVER AMERICA NEEDS POWER

America's fighting Engineers and Seabees really work miracles. Sand dunes are leveled. Jungles are cleared. Landing strips appear overnight. Staggering loads are moved over land and sea.

Helping them work these miracles are General Motors Diesel engines.

Because these engines are rugged and dependable, they get the toughest kinds of jobs to do.

Because they take so little fuel, they save precious transport space.

Because they have been designed for simplest maintenance, they stay on the job and keep on the go.

War is a tough proving ground for engines. It shows their mettle, reveals their stamina. As they perform their wartime tasks, these GM Diesels are proving the service they will continue to render in the many civilian needs for dependable, economical power after the war.

The Army-Navy "E" for efficiency in war production flies proudly over the GM Diesel plant in Detroit.

KEEP AMERICA STRONG
BUY WAR BONDS

GM
GENERAL MOTORS
DIESEL POWER

ENGINES . . 15 to 250 H. P. . . DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.

ENGINES . . 150 to 2000 H. P. . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

LOCOMOTIVES . . . . . ELECTRO-MOTIVE DIVISION, La Grange, Ill.

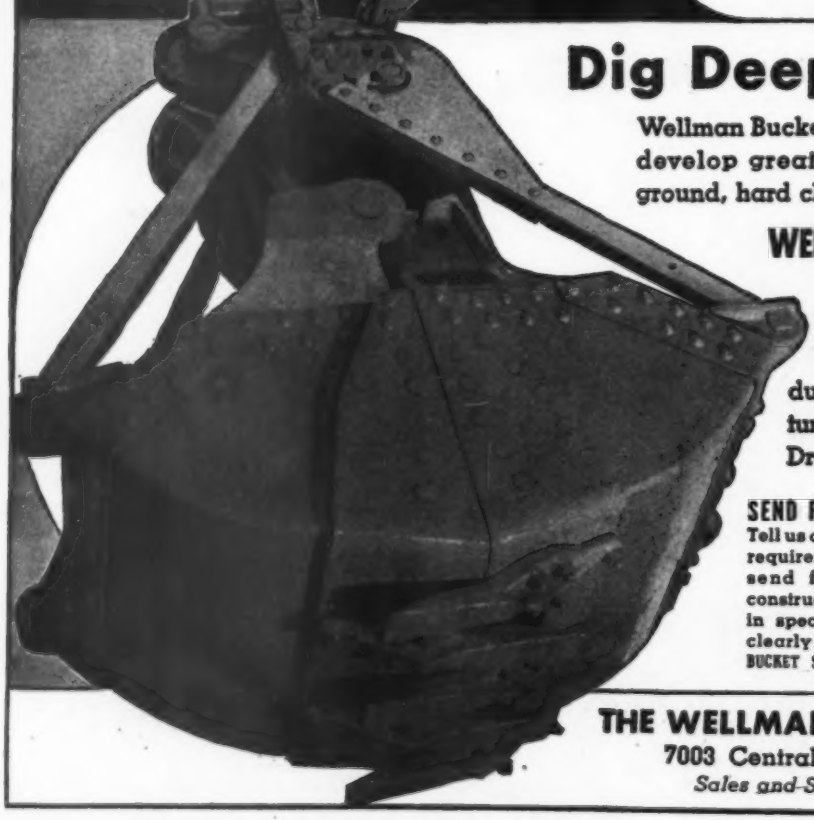
AMERICA IS
Built with Aggregate!
SMOOTHER BEDS
Building the nation's vast network of railroads created a market for countless millions of tons of aggregate and each year millions more should be added to keep them smooth. During the past few years this has been impossible because of labor shortages.
The outlook now is for ballast to be one of the big markets for producers of crushed stone and gravel. The railroads have plenty of funds available for track maintenance and, if the supply of labor permits, they will use it for that purpose.
Cedarapids aggregate producing
for RAILROADS!
and crushing equipment will help you produce better aggregate for ballast, highways, airports and other construction jobs, and it will cost you less too. Remember this — the Cedarapids line is complete and will meet any aggregate production problem either from the standpoint of output or character of materials for either an entire plant or a single piece of equipment. You'll be way ahead if you come to Iowa now for your essential needs and be one of the first in line for postwar deliveries. See your Iowa dealer right away or write direct.
IOWA MANU
CEDA
G COMPANY
OWA
CEDAR RAPIDS
ARMY
E
NAVY
Ewing Galloway Photo
Cedarapids
Built by IOWA
THE IOWA LINE
of Material Handling Equipment Includes
ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS — TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

U. S. A. Signal Corps Photo

GALION MOTOR GRADER
ON ACTIVE DUTY WITH U. S. ENGINEERS IN INDIA

The GALION IRON WORKS & MFG. CO.
Main Office and Works: GALION, OHIO

WELLMAN WILLIAMS TYPE **BUCKETS**



Dig Deep and Bite Clean

Wellman Buckets, in Power Arm and Multiple Rope Types develop great digging power. They bite into frozen ground, hard clay or shale, and come up with full loads.

WELDED ROLLED STEEL CONSTRUCTION
FOR GREATER STRENGTH AND LONGER LIFE

Welded design which made Wellman Buckets so universally preferred for heavy duty in steel plants and dredging, is now featured in all Wellman-Williams Clamshell and Dragline Buckets—⅜ to 16½ yd. capacities.

SEND FOR FREE BULLETIN
Tell us about your particular requirement and we will send full description of construction and features in special bulletins which clearly proves why YOUR NEXT BUCKET SHOULD BE A WELLMAN.

THE WELLMAN ENGINEERING COMPANY
7003 Central Avenue • Cleveland 4, Ohio
Sales and Service Agencies in principal cities

PRECISION-GROUND **CAMSHAFTS**

another "HIDDEN VALUE" in all **WISCONSIN** *Air-Cooled* **ENGINES**

The "Camomatic" is another of those more-than-human machines that help to put heavy-duty serviceability and smooth-running efficiency into every Wisconsin Engine.

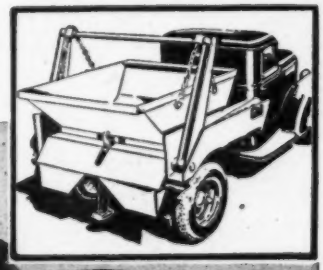
This machine automatically rough-grinds (and subsequently "smooth-finishes") each and every cam for every Wisconsin Air-Cooled Engine. The grinding wheel finishes cam contour with absolute precision and uniformity. Every camshaft for a given size engine, is exactly like all the other camshafts for all the other engines of that size.

This is another of those features you *don't* "see" . . . but it performs an important service for you on the job, on your equipment.

Most H.P. per pound **WISCONSIN MOTOR** Corporation
MILWAUKEE 14, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

Ready for **1945 ECONOMY**

With the new Brooks ENCLOSED TYPE CONTAINER for use with Brooks LOAD LUGGER



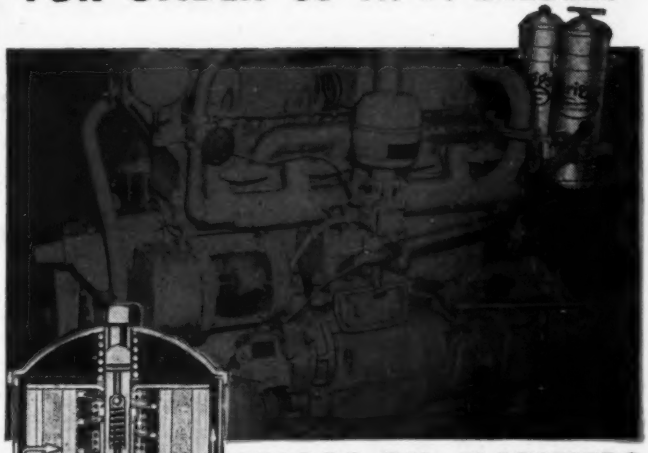
Brooks LOAD LUGGER equipped with the Enclosed Type Refuse Container (replacing the regular Dump Bucket, shown above) can be used by municipalities for collection of garbage and waste in congested sections.

Hotels, restaurants and public buildings can accumulate refuse in these sanitary containers for pick-up by Load Lugger trucks. Handy for disposal of street refuse, as containers can be spotted at convenient points.

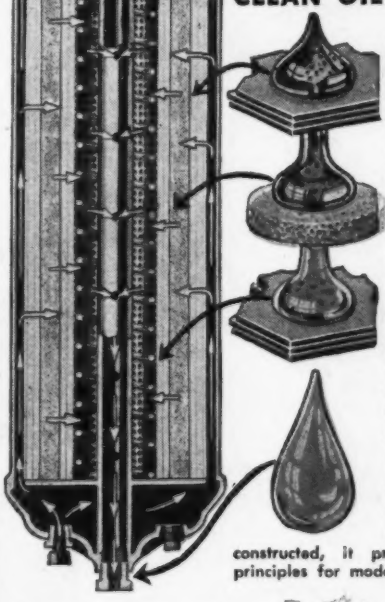
512 DAVENPORT ROAD, KNOXVILLE 8, TENN.
Distributors in All Principal Cities

Brooks EQUIPMENT & MFG. CO.
KNOXVILLE TENNESSEE

Get this
"PERFORMANCE PROTECTION" FOR UNDER 35 H. P. DIESELS



BRIGGS OIL CLARIFIERS
CLEAN OIL 3 TIMES—3 WAYS



CLARIFIES
Suspended, insoluble impurities are removed by ABsorption through first layer of cellulose.

PURIFIES
Soluble impurities . . . gums, resins, acids that cause sludge formation and premature engine wear . . . are removed by ADsorption through Fullers Earth.

FILTERS
Insoluble impurities smaller than 7 microns (.0003") are removed by ABsorption through second layer of cellulose.

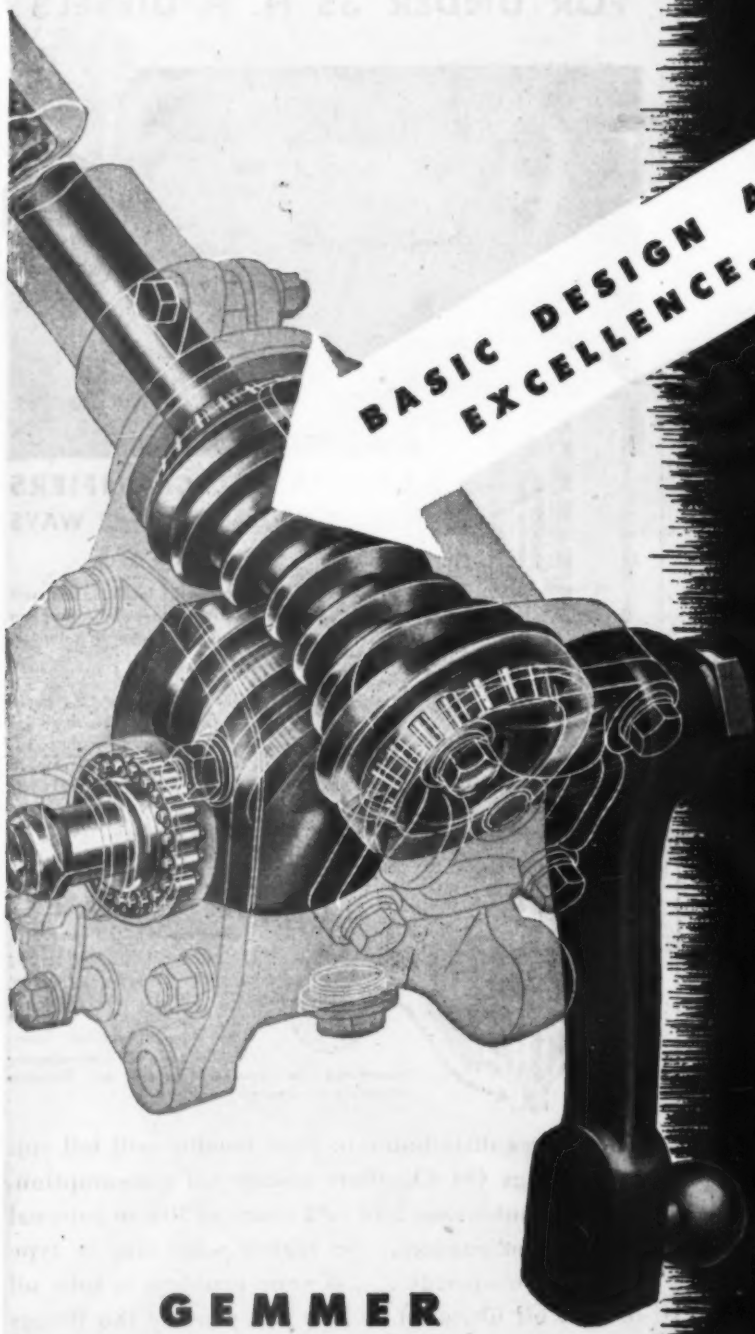
OIL THAT IS RETURNED TO THE ENGINE IS "REFINERY-PURE".

Cross section of the Briggs G-800 Lube Oil Clarifier. Scientifically designed and ruggedly constructed, it provides modern oil filtration principles for modern engines.

The Briggs distributor in your locality will tell you how Briggs Oil Clarifiers reduce oil consumption, lower maintenance and add years of life to internal combustion engines. No matter what size or type engine you operate . . . if your problem is lube oil or fuel oil filtration . . . he can provide the Briggs Oil Clarifier that will end your problem.

Briggs
PIONEERS IN MODERN OIL FILTRATION

BRIGGS CLARIFIER COMPANY
GENERAL OFFICES—WASHINGTON 7, D. C.
DISTRIBUTORS IN PRINCIPAL CITIES



BASIC DESIGN ASSURES STEERING EXCELLENCE...LONG SERVICE

GEMMER STEERING

Note the basic design of the Gemmer Steering Gear. An hourglass worm engages gear teeth that *roll*. Anti-friction bearings are placed at all critical points. Absence of sliding friction provides highest efficiency—easiest transfer of power—easy steering with plenty of power for parking.

Design and construction are also exceptionally sturdy and compact—providing abundant strength, long endurance—ease of installation—saving of weight without sacrifice of overall capacity or steering arm angularity. Alloy steel forgings provide ample safety factor. Internal stresses are low.

A Gemmer Steering Gear will last, and *give satisfaction* for the life of the vehicle.

Simple:—Just a few parts—nothing complex—nothing to get out of order or require frequent adjustment.

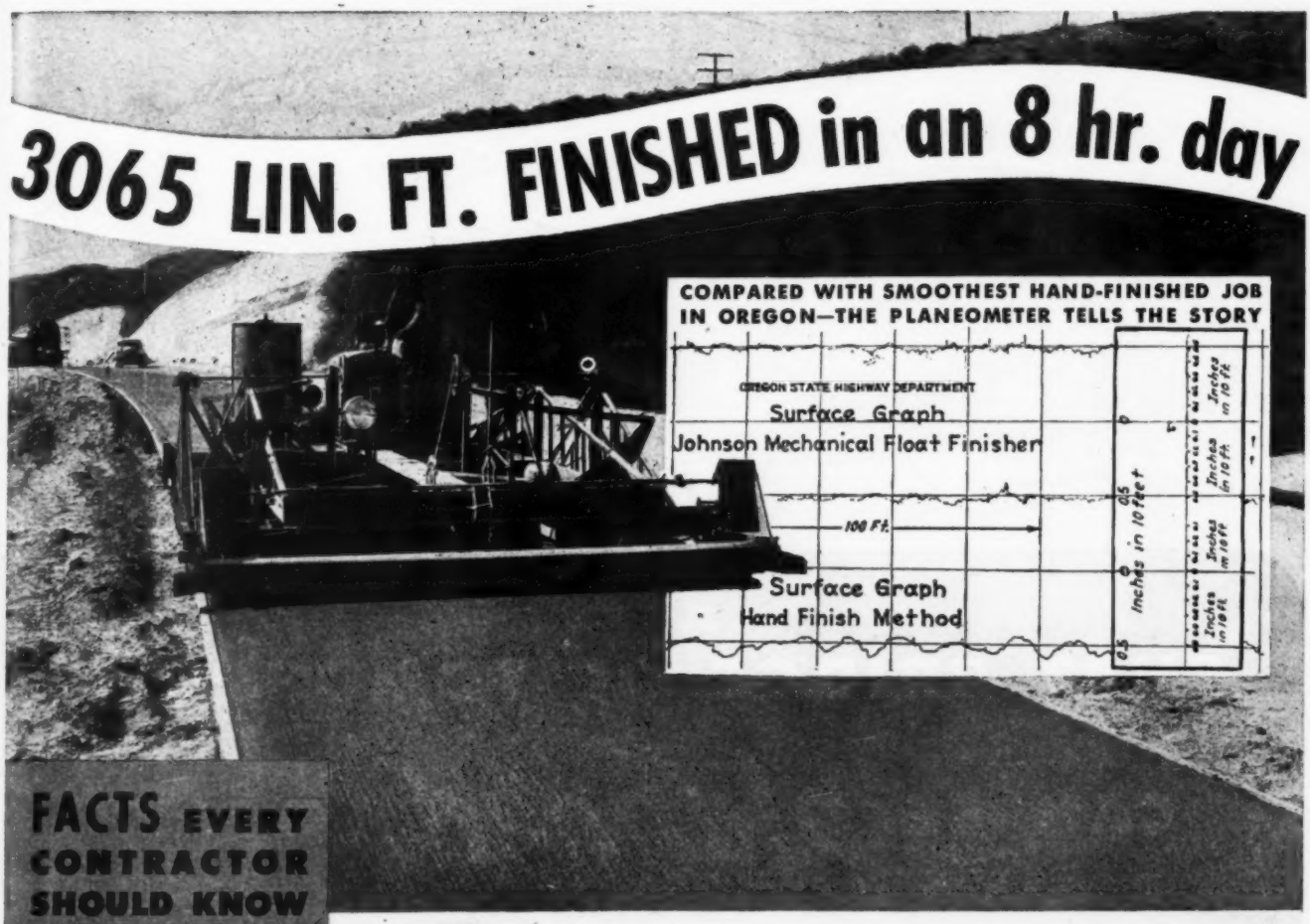
Stable:—No "lost motion"—wear reduced to least possible minimum. Steering is always firm, responsive, positive with absence of rubbery feeling and—wander.

Gemmer Steering is demonstrating its worth in every type of automotive vehicle from the lightest passenger cars to the heaviest buses and trucks—in the road-building machinery, agricultural tractor, and marine fields.

GEMMER
MANUFACTURING COMPANY
6400 MT. ELLIOTT
DETROIT 11, MICH.

GEMMER . . . Pioneer of Efficient Steering

3065 LIN. FT. FINISHED in an 8 hr. day


COMPARED WITH SMOOTHEST HAND-FINISHED JOB IN OREGON—THE PLANEOMETER TELLS THE STORY
OREGON STATE HIGHWAY DEPARTMENT
Surface Graph
Johnson Mechanical Float Finisher
100 Ft.
Surface Graph
Hand Finish Method
Inches in 10 feet

FACTS EVERY CONTRACTOR SHOULD KNOW

The Johnson Float Finisher is efficient on all modern vertical, horizontal and transverse spiral curves.

This finisher makes a smoother, more perfect road surface (see graph).

Has been in use in western states for 7 years.

Keeps up with the largest high-capacity mixers.

Maintains daily production speed—never grows tired.

Equipped with trailer hitch and wheels for short hauls.

Can be dismantled into legal truckload complying with highway regulations.

Write for Catalog

... finished with a Madsen-built JOHNSON FLOAT FINISHER

CONTRACTORS! You can increase the daily production of your paving crew . . . reduce finishing costs by 50% . . . and eliminate the bottleneck of hand float finishing with a Johnson Float Finisher. It reduces the finishing crew to two men for a complete job including edging and jointing on any paving project using a seven-sack paver.

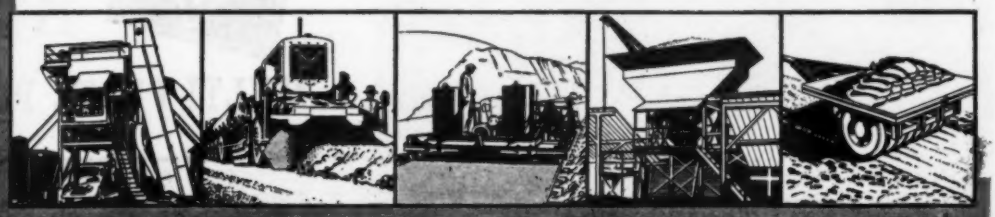
When Roy Houck, Oregon paving contractor, placed 746 cu. yds. of concrete and finished 3065 lin. ft. of pavement in an 8-hour day (383 ft. per hr.), he set a record of production and the Johnson Finisher helped make it possible.

He did not set a record for finishing—the speed of the Johnson Float Finisher is far greater than required under present-day cement concrete production methods.

With the savings in labor and the increased production of the paving crew, the Johnson Float Finisher will pay for itself in 25 miles or less of double-strip highway.

Plan for tomorrow, today! Write for Catalog No. MP-140.

MADSEN IRON WORKS
HUNTINGTON PARK, CALIFORNIA



MADSEN ASPHALT PLANTS • ROAD PUGS • CEMENT FINISHERS • BATCHERS • COMPACTORS

THAT BRIDGE OF TOMORROW CAN BE *planned* TODAY

As a highway or municipal engineer you have a double responsibility. Not only will you want to make your plans to provide jobs for returning service men and war workers, but these plans must fit a postwar world, the pattern of which is not yet clear.

You can find a practical answer to your postwar bridge problems on both of these counts by specifying ARMCO Multi Plate Pipe and Arches. This way you get a strong, durable, basic structure that can be easily installed by unskilled labor. At the same time you assure a flexibility in design and appearance that will enable you to conform to postwar standards. With ARMCO Multi Plate to support the load you can finish the bridge with any type of design and material you choose.

Other advantages include ease of transportation, quick assembly on the job site without special equipment, and freedom from maintenance.

Include ARMCO Multi Plate in your postwar plans even though you may not be able to get it for your immediate construction needs. After the war it will again be available for bridges, stream enclosures, large sewers and special drainage structures. Write us for complete data. Armco Drainage Products Assn., 35 Curtis St., Middletown, O.

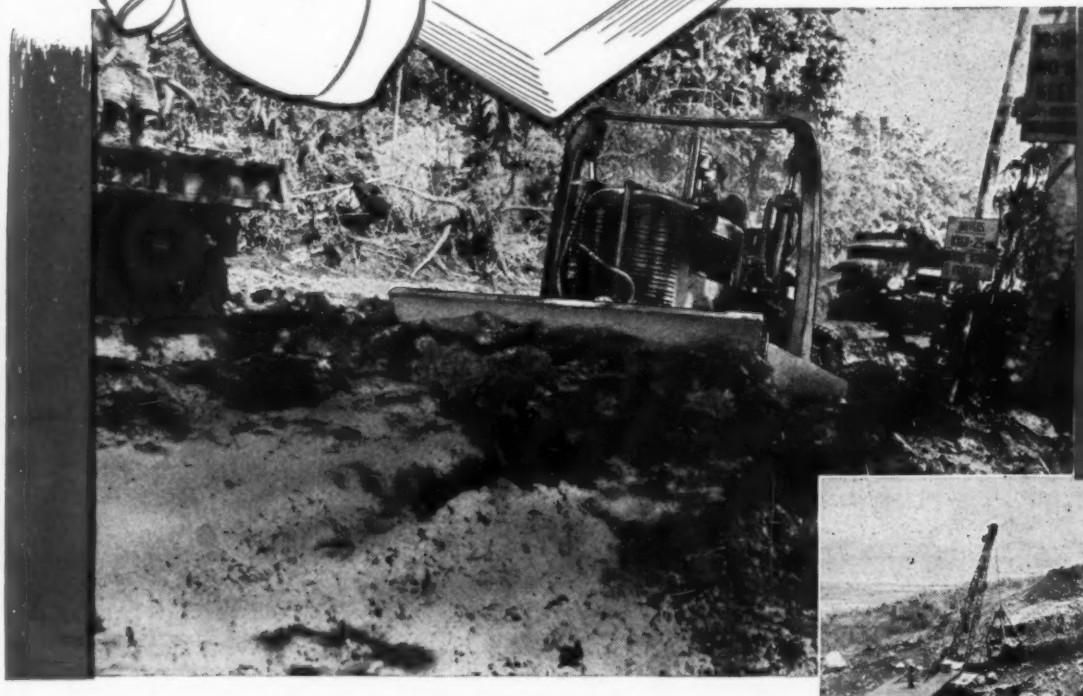
ARMCO

ARMCO

MULTI PLATE PIPE AND ARCHES

BAKERS ON *THE BIGGEST CONSTRUCTION JOB IN HISTORY*

—WORLD WAR II



Top: Baker building road in New Caledonia. Center: Making fuel "dumps" in Fiji Islands. Bottom: Dozing trees for air bases Australia.

So you think Boulder Dam and the Panama Canal were big jobs? They were pikers compared to the construction job of them all—World War II. More earth is being moved, more trees dozed, more roads, bridges and buildings built and more buildings razed than on any other job at any time.

It's taking an endless amount of construction equipment of all kinds, including Baker Bulldozers and Gradebuilders by the hundreds.

This *Biggest Construction Job* calls for speed—that's where Bakers come in. Powerful hydraulic down-pressure on the blade bites deep into Italian lava, Algerian sand or South Pacific coral —gets full loads faster. Too, Bakers are as simple as they look—fewer parts—easier to maintain. No wonder the boys in the Seabees and the U. S. Engineers swear *by* them—not *at* them.

After monthly war quotas have been met, a few units are left for high priority requirements. If yours is a war job, you may be eligible. See your Baker, Allis-Chalmers dealer.

THE BAKER MFG. CO.

506 Stanford Avenue **Springfield, Illinois**

BULLDOZERS SNOW PLOWS **BAKER** CONSTRUCTION EQUIPMENT

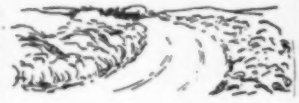
IT COSTS LESS TO CLEAR MORE WITH WALTER SNOW FIGHTERS

HERE'S WHY:

GREATER CLEARING CAPACITY

Powerful Walter Snow Fighters get maximum results from the biggest plowing equipment. Equipped with V Front Plow and Side Wings, the 250 H.P. model clears a 28 ft. width in one run—a two-lane road in one round-trip!

FASTER PLOWING SPEEDS

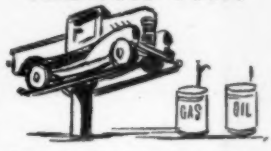


The unmatched traction provided by Walter Four-Point Positive Drive eliminates slipping, stalling and wheel-spinning — keeps Walter Snow Fighters charging ahead at speeds unequaled in the field of snow removal.

FEWER TRUCKS NEEDED

This speed and capacity produce a remarkable volume of snow removed per hour—enabling you to cut costs by using fewer trucks to cover your routes.

LOWER MAINTENANCE AND FUEL COSTS



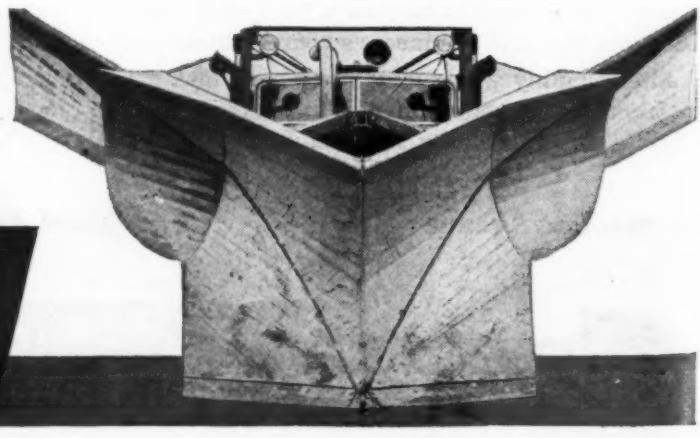
Fewer trucks to service means lower operating costs—takes a big load off garage facilities normally strained by winter breakdowns.

In highway budget arithmetic, Walter Snow Fighters' faster clearance means lower-cost-per-mile. And in the eyes of the taxpayers, it means a more thorough job of snow removal. Road-blocking drifts are speedily cleared. Snow is removed before it packs and freezes into dangerous ruts. Main highways are completely widened-out. More miles of secondary roads are opened.

The outstanding power, traction and speed provided by the exclusive Walter Four-Point Positive Drive is the key to this performance. Three automatic locking differentials proportion power to each of FOUR driving wheels according to their traction at any instant. No wheel shirks, every wheel works!

There's a real engineering story behind the exceptional record of Walter Snow Fighters. Write today for detailed literature.

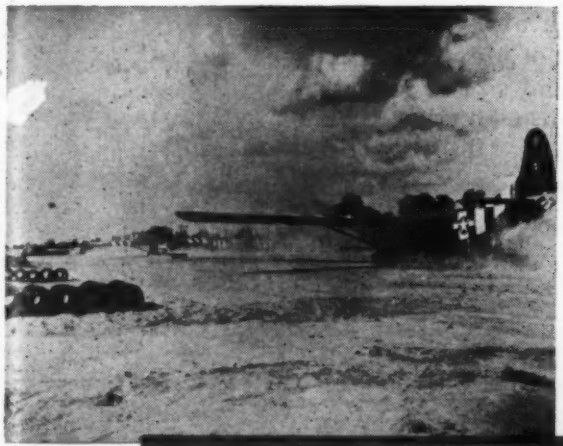
WALTER MOTOR TRUCK COMPANY
1001-19 IRVING AVE., RIDGEWOOD 27, QUEENS, L. I., N. Y.



WALTER SNOW FIGHTERS

FIRST IN WAR . . . FIRST IN PEACE

"PITTSBURGH" REINFORCEMENT *is vital to highways and skyways*



First requirement of war-time landing fields in battle zones is a strong, relatively smooth runway surface that safely carries the load of bombing, fighting and transport aircraft. In this vital service *Pittsburgh* welded wire fabric mats are shown above as they were unrolled somewhere in France.

First requirement of peace-time landing fields for expanded air transportation uses will be runways, hangar aprons, floors, approach roads and connective highways of concrete, reinforced for service and permanency with *Pittsburgh Welded Wire Reinforcement.*

For *Pittsburgh Welded Wire Reinforcement* adds to concrete construction the strength inherent to steel . . . resulting in control of incipient cracks, greater resistance to traffic loads, proved lower maintenance cost and longer life.

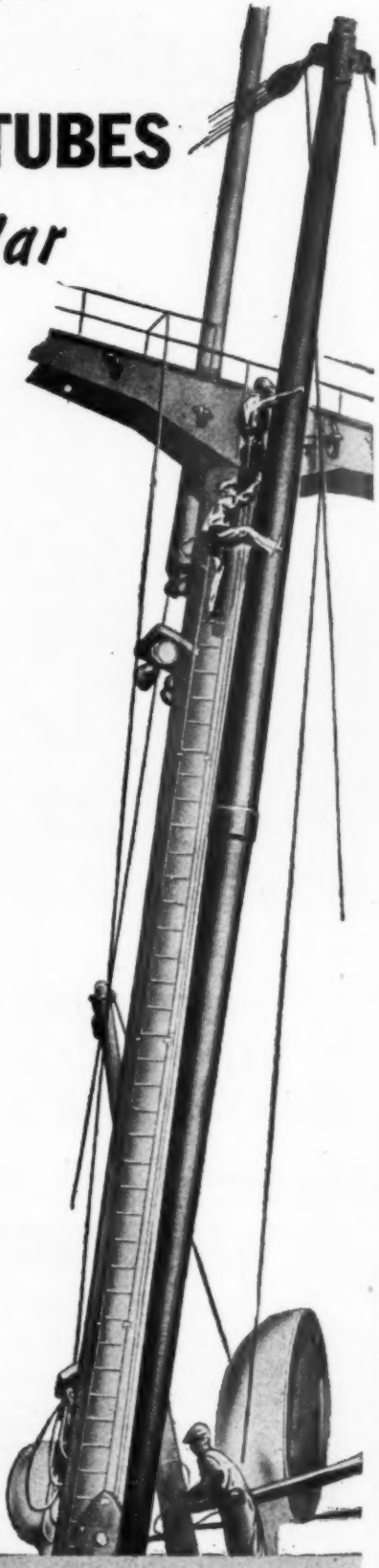
If it's made of concrete it should be *reinforced* . . . for accurate spacing and high tensile strength, specify *Pittsburgh Welded Wire Reinforcement.*

PITTSBURGH STEEL COMPANY

1661 GRANT BUILDING · PITTSBURGH, PA.

PITTSBURGH *Welded Wire* REINFORCEMENT

How We Made MONOTUBES SHIPSHAPE *for War*



LIKE most job-experienced engineers and contractors, you are doubtless familiar with the Monotube tapered pile... know how its lightness, strength, and extendability make cast-in-place piled foundations safer, faster, and cheaper to install. But have you heard the story of how Monotubes went to sea?

When global war stimulated the building of thousands of ships, great numbers of cargo-handling booms were urgently needed. Working to exacting Maritime Commission specifications, Union Metal engineers adapted the Monotube tapered principle to this new use. The result was the Monotube *boom* pictured at right . . . balanced, light weight, strong . . . favored by the Army, Navy, and Merchant Marine alike.

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Monotube tapered piles are still obtainable for *essential* building . . . and there'll be unlimited numbers ready for the postwar building boom. When you think of cast-in-place piled foundations—think of Monotubes. Available in gauge, taper, and size to meet all requirements. The Union Metal Manufacturing Company, Canton 5, Ohio.

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Monotube Tapered Piles

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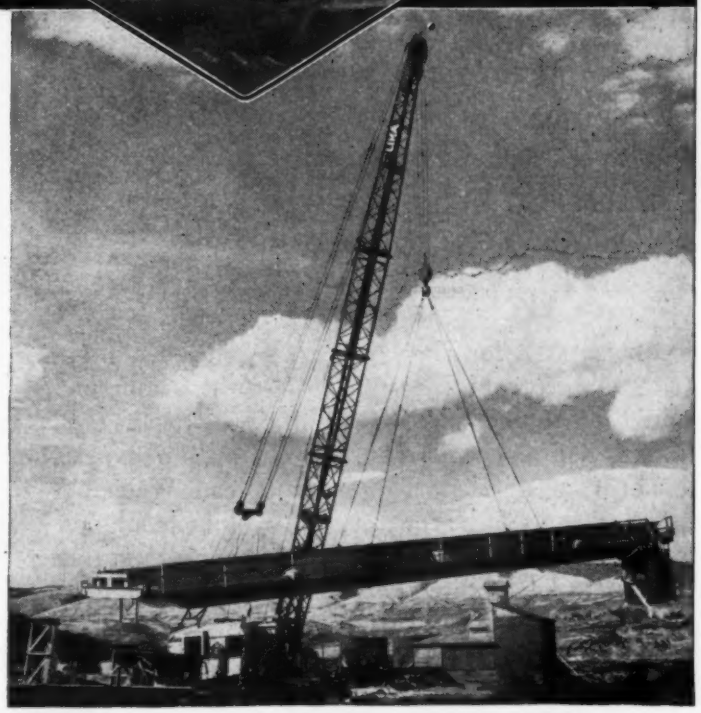
Whatever may be your earth moving or material handling problem, you can depend on LIMA for the right size and type of Shovel, Crane or Dragline to do the job quickly and efficiently. LIMA excavators are manufactured in eight different sizes ranging fronf ¾ cubic yard to 5 cubic yards. Crane capacities range from 13 tons to 100 tons. Dragline capacities vary, depending upon the nature of the work. Each unit, regardless of size, is ruggedly constructed for hard continuous usage. Every part is designed and built especially for the work the part is to perform. LIMA Shovels, Cranes and Draglines will give you a new conception of power, speed and efficiency on any earth moving or material handling job. Right now, practically our entire output is going to the Armed Forces. After victory your excavator needs will have our closest attention.



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Remember this record of performance when you are planning the highways of the future. Give them the extra life, greater durability they can have only with steel mesh reinforcement. Safeguard them by specifying American Welded Wire Fabric.

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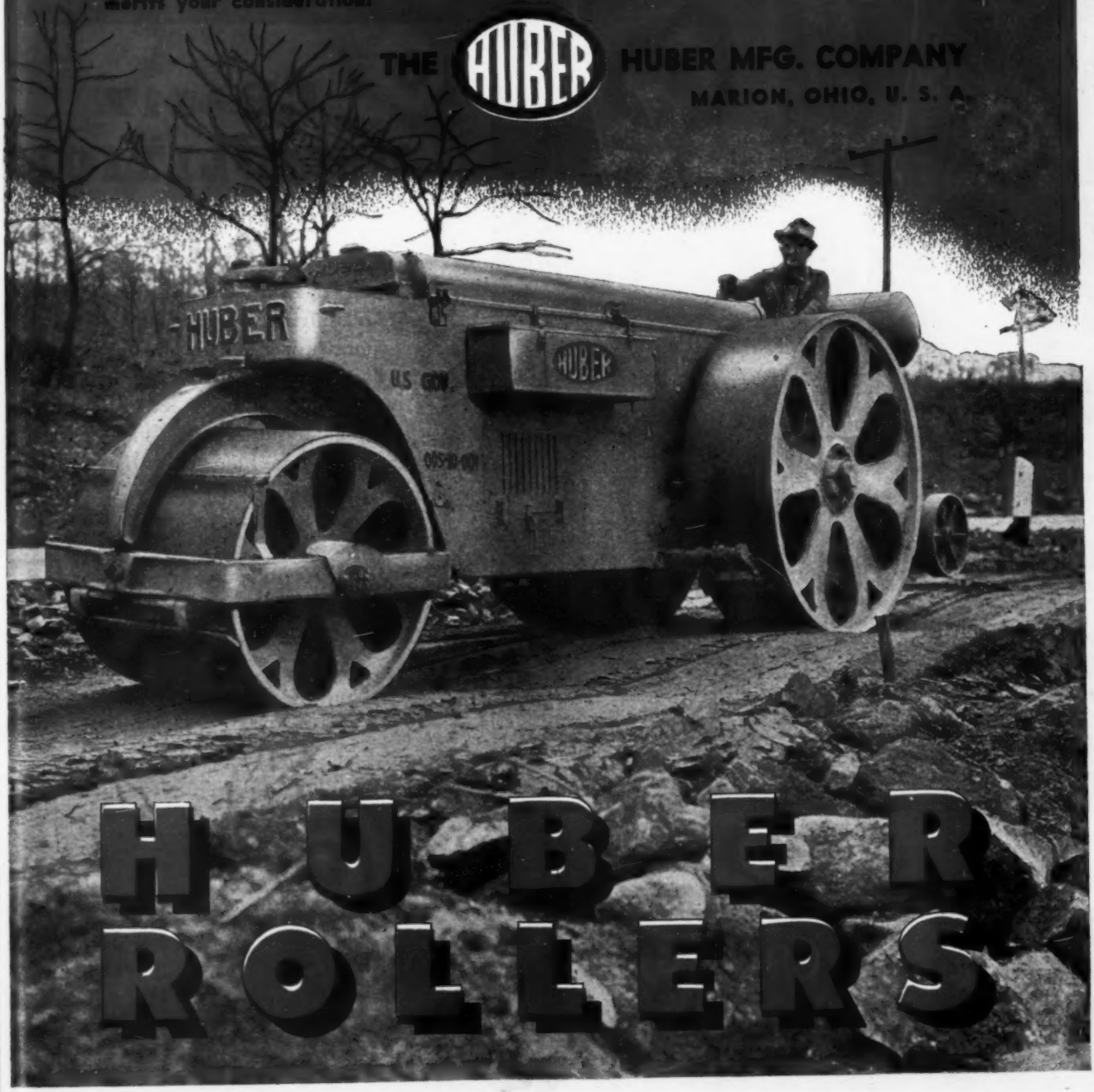

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CP No. 117 Demolition Tool is only one of the large Chicago Pneumatic line of Demolition Tools, Sinker Drills, Drifters, etc. Write for complete details.

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FWD TRUCKS AVAILABLE FOR CIVILIAN PURCHASE ON AND AFTER JANUARY 1, 1945

GOOD NEWS — FWD four-wheel-drive trucks, pre-eminent in war services, with production previously restricted almost exclusively for the military, are soon to be available for motor transport, highway, utility, oil fields, and other essential civilian services.

Recent directive from the WPB provides for production of substantial number of FWD trucks in a wide variety of models and types, 2½ to 15 tons capacity; such trucks to be built only for essential civilian uses. FWD trucks built under this release will be available for purchase on and after January 1, 1945. Deliveries will be made in keeping with priority of orders as received; immediate action and prompt placing of orders is urgent to assure delivery before limit of production is reached.

Write—wire—or phone us directly, or the nearest authorized FWD dealer for full information and your eligibility to purchase under these new rationing regulations.

THE FOUR WHEEL DRIVE AUTO CO.
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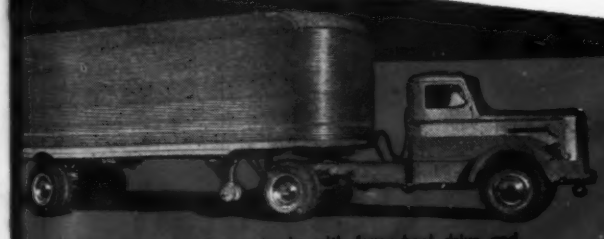
FWD TRUCKS

These and other FWD Trucks, 2½ to 15 tons capacity, available to qualified purchasers.



FWD's "H" series tractor trucks with four-wheel drive and gross vehicle weight ratings from 40,000 lbs. to 60,000 lbs. Powered with gasoline engines ranging from 100 to 120 horsepower on wheelbases from 120" to 144" in conventional or cab-over-engine types.

"U" series FWD's with gross vehicle weight capacities of 22,000 to 28,000 lbs. Powered with 125 h.p. gasoline engines, 5 speed transmission, 11:00x20 tires, wheelbase 150". Four wheel drive.

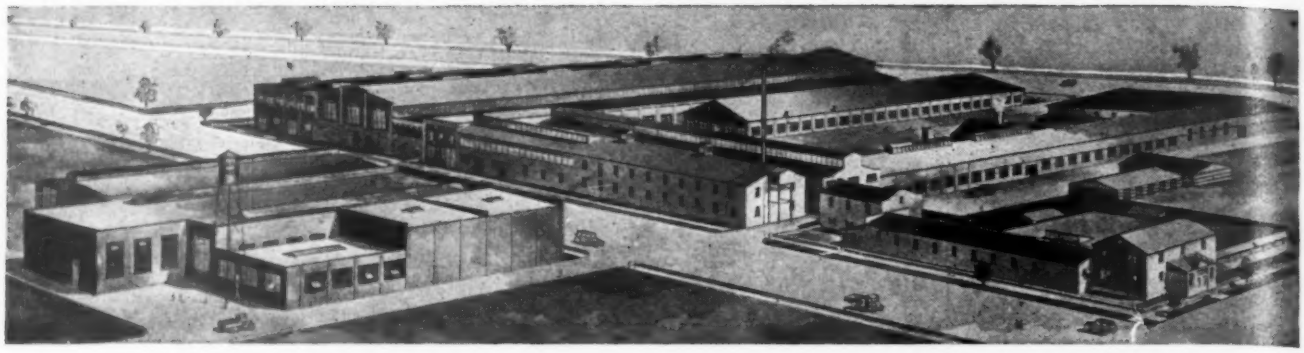
Six-wheel drive FWD trucks with gross vehicle weight capacities of 55,000 lbs. Powered with either gasoline or diesel engines of 150 and 200 horsepower. Wheelbase from 214½" to 276".

Straight trucks in FWD's "H" series range 17,000 to 20,000 lbs. gross vehicle weight capacity with wheelbases from 144" to 154" gasoline engine powered with power plants from 100 to 120 horsepower and with four-wheel drive.

Utility Line Construction and Maintenance trucks by FWD with 5 and 7 man cabs, special power-take-offs and line bodies. Powered with 115 h.p. engine on 144" wheelbase with four-wheel drive, 5 speed transmission, 144" wheelbase and 9:00x20 tires.

FWD's four-wheel drive Road Maintainer — built for underbody scraper use with extra heavy frame and other features that make it the ideal unit for street and road maintenance. Engine 115 h.p. — 5 speed transmission — 8:25x20 dual tires.

"H" series FWD's powered with either gasoline or diesel engines ranging from 150 to 200 h.p. and with capacities ranging from 30,000 to 42,000 lbs. gross vehicle weight. Four wheel drive.



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9 DR 30's on this JOB!

U. S. NAVY OFFICIAL PHOTOGRAPH

Pneumatic tires can be had if specified by purchaser in his application for priority to Construction Machinery Branch of War Production Board.

• Plenty of rock here! So husky, maneuverable Cleveland DR 30 Wagon Drills were used to good advantage at this large, west coast naval base.

Here are 7 REASONS why the DR30

IS THE MOST POPULAR WAGON DRILL EVER BUILT:

1. They drill at *any* angle and in *any* direction, flat holes from 4" to 8' aboveground, also straight up or down.
2. Feed capacity is over 8 feet, and the Cleveland DR 30 handles depths to over 25 feet.
3. The recoil device holds machine to its work, and increases the drilling speed from 10 to 25%.
4. Forward leg point holds the drill and steel in line whether operating in down, flat or angle holes.
5. Centralizer keeps steel from "walking" when starting hole, prevents breakage of bit points.
6. The twin jack-screw mechanism permits easy moving of U-bar, and also shortens set-up time.
7. The main wheels swivel 90° for line drilling, and 180° in order to obtain narrower tread.

Ask for Bulletin 132

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The men of our fighting construction battalions know what the rugged easy-to-handle qualities built into each Link-Belt Speeder mean when you've got to work fast — and do it right the first time! These machines are built to give constant maintenance-free service — and they're doing it on fighting fronts and behind the front everywhere!

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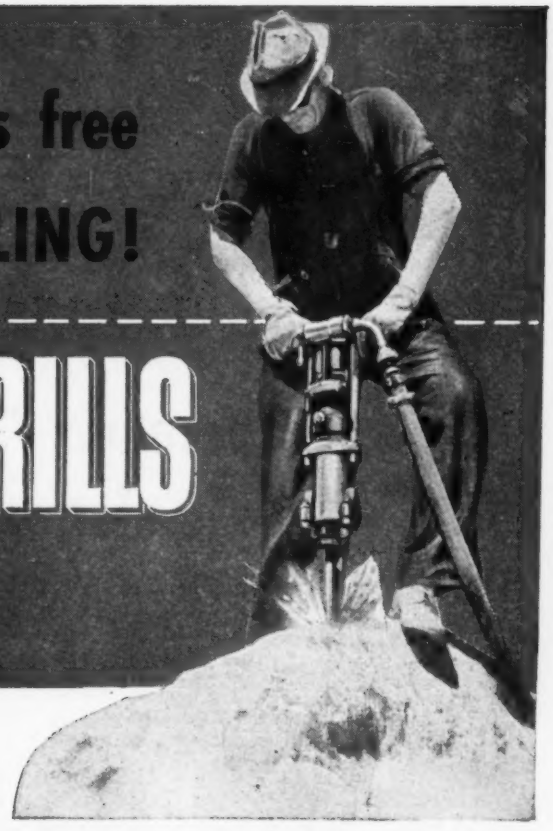
They BLOW all cuttings free for FASTER, SURER DRILLING!



Thor ROCK DRILLS

Full-Pressure Air Blast Straight Through the Tool Assures Positive Hole-Cleaning

There's no accumulation of cuttings at the drilling point to cut down speed or stall the drill by jamming the steel when Thor Rock Drills let go with their *full-line* blast of air to keep the hole clean . . . to keep the drilling rate fast and steady!

Powerful hole-blowing is an important advantage of all Thor Rock Drills which not only steps up drilling speed for more footage per shift, but also slashes maintenance costs by extending the life of both the tools and the drill steels through minimum vibration.

HERE'S WHY CUTTINGS WILL NOT STALL THOR ROCK DRILLS!

Full-Line Pressure—Exclusive Thor design places exhaust ports to remove all air from *below* the piston when the operator blows the hole. Full-line air pressure is concentrated behind the piston to force it down tight against the steel—directing full air power straight through the machine and into the hole.

No-Float Piston Control—Forcing the piston tight against the steel prevents floating and fluttering inside the cylinder during the blowing operation. No air is wasted. Hole-blowing is extra-efficient and powerful.

Minimum Vibration—The air tube inside the piston and hammer is *held rigid* by tight joining of the piston and steel to assure longer service life by reduction of vibration.

For complete information about this important hole-blowing advantage of all Thor Rock Drills—plus added features of spring-enclosed retainer design, "measured air" valve action, and many others—write today for Catalog 42-A.

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SHOVELS • DRAGLINES • CRANES • PULL-SHOVELS
CLAMSHELLS • WALKERS • *from 3/4 cubic yard up*

Typical of the exhaustive field tests which marked the development of the modern, high speed Cummins Diesel, was the gruelling 14-day grind which came to an end on Christmas Day, 1932, at the Indianapolis Speedway. Here, under AAA supervision, a Cummins-powered Indiana truck set a non-stop distance record for trucks: 14,600 miles (5,840 laps of the 2½-mile oval!).

The injector cup wiper is an inconspicuous part of the Cummins Diesel, but its development made a conspicuous contribution to the Cummins Diesel's efficient and economical performance. This patented cup wiper, perfected only after countless modifications in piston design, eliminates carbon on the injector cup, creates additional turbulency, assures more complete combustion.

Metallurgy plays an important role in the Cummins Diesel trend to ever lighter, stronger construction. Example: 5,000 samples were analyzed in selecting the cast iron for the block—a foundry was rebuilt and its methods completely revised—but the increase in tensile strength from 20,000 to 50,000 pounds per square inch more than justified the cost.

CUMMINS DEPENDABLE DIESELS

Automotive Models: Designed for all types of heavy-duty trucks in either highway or off-the-highway service.

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Industrial Models: Portable and stationary engines, power units, and generating sets for service in any industry requiring heavy-duty power.

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Marine Models: Propulsion engines and marine type generating sets designed for all types of fishing boats, work boats, and pleasure craft.

Spade Work

The diesel's higher thermal efficiency was proved many years ago . . . but it took the builders of Cummins Diesels to prove that diesel engine weights and dimensions could be brought within practicable limits. They proved it in 1932 with the original high speed diesel . . . proved it after 14 years of intensive "spade work" in the refinement of lubrication, cooling, metallurgy and many other aspects of design and construction . . . proved it by putting diesels in equipment and on jobs where diesels had never worked before. Today, you will find diesels in virtually every automotive, industrial, and marine service that requires heavy-duty power . . . and if you look closely enough, you'll find a very large proportion of those diesels are Cummins Dependable Diesels.

CUMMINS ENGINE COMPANY, INC., Columbus, Ind.

NOW SUPER-ARMORED WITH RAYOTWIST CORD

plus positive O-P-E-N C-E-N-T-E-R traction

International Diesel Tra... for dual-equipped with Goodyear Sure-Grips, Mississippi Wagon Trailer on Goodyear All-Weather Earth-Movers.

LONG the first choice of contractors for off-the-road operations, these tough Sure-Grips have even greater job stamina today because they're now armor-built with Rayotwist cord—Goodyear's patented rayon cord — making *the strongest body ever used in a work tire!*

With Rayotwist-armored carcass, these Goodyears are by far the finest work tires that can be built from today's available materials — including the mandatory amount of synthetic rubber. They deliver more ton-miles of heavy-duty service.

And thanks to its O-P-E-N C-E-N-T-E-R *self-cleaning* tread, this tougher-than-ever tire has no dead-end pockets to trap mud and cause slippage. Its wide, unblocked channels sluice out dirt and stones, leaving those massive lugs free to bite deep and pull in any going.

This adds up to the longest-lasting, hardest-working tire available — a tire that delivers *more work at less cost!*

For proof of that, ask the men who are using Goodyears. When you do, chances are you'll soon be using them too.

Rayotwist, Sure-Grip, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

THE RIGHT TIRE FOR EVERY JOB

HARD ROCK LUG	ALL-WEATHER EARTH-MOVER	SURE-GRIP
for all rock work	for drawn dirt-movers	for traction in soft going

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GOODYEAR

THE GREATEST NAME IN RUBBER

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

ROADS AND STREETS

November, 1944, Vol. 87, No. 11

Ready-Mix at Niagara Falls Airport

On Dutcher-Schultz contract, Cooney Bros.' fleet of 5-ton truck mixers supplied 33,000 cu. yd. vinsol-resin concrete for new runway and extensions. Paving job simple but creek diversion and other drainage excavation ran into rock troubles

By HAROLD J. McKEEVER
Editor, ROADS AND STREETS

I'M ONE of those fellows who still senses that something is "missing" when there's no paver in sight on a concrete runway job. The space along the forms ahead of the finishing machine has that empty look, like when a tooth is pulled.

But, the fact remains that truck mixers sometimes come very nicely into the deal. The recent runway extension work at Niagara Falls (N. Y.) Municipal Airport now serving Bell Aircraft Company is a case in point. All concrete was purchased delivered from the well-known Cooney Bros. of Tarrytown, N. Y., who set up a plant on the job. Dutcher Contracting Corp. and John B. Schultz Contracting Co., of Buffalo, had the general contract as a joint firm. And a nice piece of work it's been, considering the lean and hungry days on construction work generally at the moment.

Dutcher-Schultz' price of approximately $870,000 included, besides 33,000 cu. yd. of concrete pavement, about 100,000 cu. yd. of shallow field stripping and leveling, 170,000 cu. yd. of drainage channel excavation (including 20,000 cu. yd. of rock), 16,000 lin. ft. of concrete pipe drainage (8 to 24 in.) and sundry items.

Paving work included one new 150x5500 ft. concrete runway, and extensions of two existing runways tying into the new runway at either end; also two concrete taxiways and a small amount of asphalt surfacing of existing intersections and taxiway areas, to bring them up to new load carrying capacity and surface elevation.

Drainage was quite a problem all around. On July 15 simultaneously with the start of field grading, three or four outfits began spot digging on a 2-mile open creek diversion channel which extends around two sides of the field and ties into the drainage system with lateral ditches. The creek channel with depth up to 12 ft., was excavated 30 ft. wide on the bottom, with 2 to 1 bank slopes, or 1 to 4 in rock. Most of the digging was in a stiff, impervious clay which oozed water despite the dry weather. One 1¼-yd. shovel loaded self-powered wagons; another, 10-ton trucks. The shovels needed all the reach they had, since the hauling units had to stay up

Truck-mixers delivering from both sides placed concrete for as high as 1,080 lin. ft. of 25-ft. strip (10½-7-10½ cross sect.) per 10-hr. day at Niagara Falls Municipal Airport. Four hand shovelers and four men on the chutes made up a normal crew in front of the finisher. Note characteristic "roll" of the freshly placed air-entraining concrete

Self-powered scrapers worked drainage ditches in good going, while a shovel-wagon and a shovel-truck outfit were spotted elsewhere

Showing a partly excavated section of creek-diversion channel being taken down to bottom level through wet clay and shale. A pull-shovel had previously passed along the centerline, digging a dipper-wide trench shown by arrow, to facilitate draining and drying out of the tight soil. Ditch slopes here were dressed with blades

For the first base layer a light dozer spread dumped slag screenings, which were then bladed and rolled into a 3-in. carpet on the compacted subgrade

Spreading slag for the first of two 6-in. rolled base layers following the 3-in. screening course. Ten-ton trucks speeded delivery, and drivers tail-gated skillfully to spread their loads and minimize dozer work

on the bank much of the time. A third outfit consisted of two or more 13-yd. tractor-drawn scrapers with a light push tractor helping out between other duties.

Limestone encountered irregularly along several hundred feet of ditch bottom was shot with 40% gelatine using holes at 6 ft. intervals. Fago Const. Co. of Buffalo, which subcontracted the shooting, drilled to blast full channel depth in one lift, using two compressors and a combination of wagon and hand-held drills. The prevalence of rock, with nearly double the anticipated rock yardage, accounted for the use of shovels rather than draglines in the general channel work.

Ditchers and Scraper Outfit on Pipe Drainage

The storm water collection system included one long line paralleling the new runway and 175 ft. back from it. Tile subdrains along pavement edges consisted of 8-in. half-open-joint lines installed mainly for subdrainage but in some instances for surface collection. Trenching for pipe drainage was done by two ditchers, and one scraper outfit, the latter working outlet ditches. Tile was backfilled with porous material plus clay capping, using dozers.

Stripping and stockpiling topsoil, and runway grading, were handled by tractor-drawn and self-powered scraper units, assisted by semi-trailer wagons loaded with an elevating grader or a shovel, depending on depth and digging conditions. Much of the grading was shallow (under 1½ ft.) but widely dispersed in area. Two sheepsfoot units and two sprinklers took care of compaction.

Runways for Heavy Planes

The runway cross section is of interest in that it consisted of a 3-in. rolled layer of slag screenings; two 6-in. slag courses of slag screenings, each rolled and the second layer choked; and 10½-7-10½-in. concrete.

Two 10-ton three-wheel rollers sufficed, one working ahead on preliminary base courses and one just ahead of the concreting. Four roller passes were required on each slag layer. Screenings were spread with a light dozer and skimmed with a motor grader. Slag was delivered in 10-ton trucks, spread by a medium-weight dozer and bladed by the same grader which also spread screenings for the choke. Final leveling off was done with a contractor-built wooden screed.

Ready-Mix Delivered from Both Sides

Ready-mixed concrete came from a 150-ton batching plant with 5-yd.

Fago Const. Co., sub-contractor, drilled at 6-ft. intervals for shooting out 4 to 8 ft. of rock depth, usually in one lift

A 1¾-yd. crane with 60-ft. boom and a 150-ton batch plant with 5-ton weighing hopper kept the Cooney Bros. ready-mix trucks moving out. Five-ton mix trucks carried only 4-ton batches, to save wear on trucks and permit more accurate mix control

Screeding was speeded by thoroughly spreading the concrete with hand shovels

weighing hopper, located near one end of the new runway and capable of loading a batch in 50 seconds. Most of the time 8 to 10 five-ton trucks were required. Because of the rough haul road and the desire to go easy on the trucks only 4-yd. batches were hauled. This size batch also proved more satisfactory from a mix standpoint.

Mixing in transit with vinsol-resin cement and slag course-aggregate was at first expected to set up some difficulties in concrete quality control, but fears soon vanished as the runway work got under way. However, very careful water control was required. Five minutes' minimum mixing time was specified. And every effort was made to get trucks spotted and unloaded in the least time over 5 minutes, since too much mixing tended to entrain excessive air in the concrete and make it "bulk up," as the men on the job expressed it.

Finishing equipment consisted of a finisher with two oscillating screeds, a joint machine, a float bridge (from which two men worked with 3-ft. hand floats and also lifted up dummy joint strips), and an additional steel bridge for joint finishing and edging. Runways were concreted in alternate 25-ft. strips.

A second finishing outfit was used on taxiways.

One of the advantages of ready-mix here was its flexibility, enabling the contractor to shift from one finishing outfit to another without tying up a paver, as needed to cooperate with the intensive flying operations on the existing field.

The Niagara Falls airport improvements were designed and supervised by the U. S. Engineer district office, Syracuse, N. Y.

A finishing machine with two oscillating screeds was followed by a joint machine and two bridges for final operations. One light steel bridge was used for lifting out dummy strips and hand floating; a second bridge for final troweling and edging. Note how closely the various finishing operations hugged along behind the delivery trucks. A characteristic of air entraining concrete is the absence of water sheen, which denotes retention of water thoroughly dispersed throughout the mix. Absence of surface bleeding in turn permits quicker finishing, with less manipulation once workers "get the hang," and incidentally enables the finishers to go home evenings with less overtime

(Upper scenes): A 9-in. ballast of local volcanic cinders was spread and smooth-rolled full shoulder width. Granular base was considered specially important because of the heavy snowfall (90 in. average) in this high altitude part of northern Arizona. (Lower left): Testing subgrade dug out for pavement thickening at an expansion joint. Subgrade was beveled for edge thickening by means of a towed subgrader between preliminary and final rolling. (Lower right): Applying bituminous curing compound

Arizona Rebuilds Link in U. S. 66

Arizona Sand & Rock Company completes reconstruction job after wartime hitches. Joint spacing of 600 ft. used experimentally

USE of a type of float finisher relatively new in Arizona, and experimental use of fewer expansion joints than standard, mark the 3.84-mile concrete road job on U.S. 66 west of Flagstaff. Arizona's largest single road contract of 1944, this $321,700 job kept the contractor, Arizona Sand & Rock Co. of Phoenix, busy a good part of the year fighting wartime delays and difficulties.

The project lies between Flagstaff and the huge Navajo Ordnance Depot to the west, following a line which coincides closely with the old road for part of the distance. The two ends of the project were separated by an "exception," consisting of 1.1 miles where an overpass is to be built when steel is again available.

Excavation was relatively light, 62,000 cu. yd., mostly of rock clay but including 10,000 cu. yd. of very hard volcanic rock for which two compressors and air hammers were used in conjunction with 40 per cent gelatine dynamite. Some day excavation was wasted. An 8 and a 10 yd. scraper, two blades, a dozer and three sheepsfoot units handled earth grading and compaction. Also two 1¾ cu. yd. shovels.

Volcanic Cinders for Ballast

In the absence of better local materials volcanic cinders were hauled 2½ to 4 miles from a shovel pit for 40,000 tons of borrow and 39,000 tons of ballast. A considerable part of the cinder borrow went to build up a 6-ft. fill across 600 ft. of old lake bed. The base of ballast was placed to 9 in. compacted depth over the full shoulder-to-shoulder width. As high as 23 dump trucks (5 to 16 cu. yd.) hauled in ballast which was bladed out and rolled with a 12-ton 3-wheel smooth roller ahead of the forms and 10-ton tandem roller between the forms. The contract called for ripping up 6,000 tons of the old bituminous road mat, crushing and spreading the material on the new 8-ft. shoulders and road connections, and road-mix processing and sealing. This gave a total paved width of 40 ft. The old road material was loosened with scarifier blades, windrowed and picked up with a truck crane which was later used at the batch plant.

Concrete pavement of 9-7-9-7-9 cross section was placed, one 11-ft. lane at a time, thickening to 9 in. in 2 ft. of width both at the outer edge and the center line. No steel whatever was used, the longitudinal center joint being unkeyed as well as without dowels.

Experimental Joint Spacing and Filler

At one end of the project the highway department experimentally specified expansion joints at 600 ft. in-

tervals. Wood filler was used in conjunction with the state standard seal consisting of 200-300 pen. asphalt mixed with diatomaceous earth. At the other end the usual 120-ft. joint interval was maintained and the wood filler sealed with a commercial rubber compounded at 380-410° F. Dummy joints spaced 12½ ft. were edged and later sealed in the usual manner.

Slab thickness at expansion joints was increased to 9 in. uniform in a 10-ft. transition.

The contractor used 4,600 ft. of road forms, which were brought up on a large flat rack. Form grading was done with a blade, and the grade struck off with a home-made fine-grader towed by the grader.

Several passes were made over a period of 30 minutes or so in order to correct the crown during any initial shrinkage and subsidence. Note how far the float machine ranged behind the paver

How Power Float Was Used

In between periods of delays for parts and men, the paver made fast time, the best day consisting of 1,425 ft. of 11-ft. lane in 8½ hrs. paver time. Behind the 27-E paver concrete was struck off with a mechanical spreader having an oscillating screed and tamping bar. Finishing was done by means of a power float finisher of a type used only a few times in Arizona and, hence, the object of considerable "kibitzing." It includes a roller or squeegee in front, used only occasionally to augment the spreader, and diagonal planes which skim the concrete and take the place of the usual long-handled floats. In fact, no such floats were used in the traditional manner on this job. The float finisher, as shown in the photos, made from 4 to 10 passes, in the course of which accumulation and spilling of "soup" over the forms was completely obviated and a thin mortar just sufficient to cover the coarse aggregate was left ready for brooming. A canvas drag was used on the last forward pass.

By taking the float machine back and forth over several hundred feet of pavement as the concrete stiffened, correction was made in the crown to offset any progressive shrinkage and subsidence of the slab. This machine proved to be a satisfactory means of finishing the pavement. Behind the float machine, the joint strips were partially lifted out and the surface broomed. A split float which straddled the partly lifted joint steel was given one pass along the dummy joint to iron out irregularities. Then two finishers touched up around joints with hand floats and edged all contraction as well as expansion joints.

Aggregate Problem Here

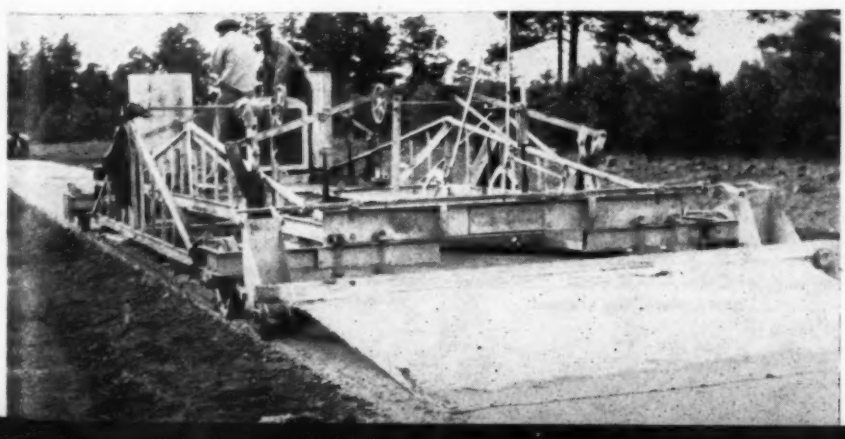
Two sizes of coarse aggregate were specified, broken over a 1-in. screen. Three batch trucks delivered to the paver from a plant consisting of a standard two-compartment bin and weighing hopper to which a third bin was attached to handle the 1-in.-minus stone. This bin chuted to the hopper along an improvised trough (see photo). Manning the three stockpiles was a ⅝-yd. mobile crane mounted on a truck chassis, a "wartime" creation which was assembled from the parts of several makes of trucks and power shovels. (Some of the crane clutch bands are truck bands, for example.)

Typifying the aggregate problem of the north central Arizona region around Flagstaff, sand had to be hauled in by rail, and stone was trucked 20 miles. A 90-ton portable crusher operated the stone pit.

Although the contractors took the job in April, they finished the season barely in time for winter. The labor roll during October when paving and ballasting were going full speed con-

Contraction joint plates were inserted through templates immediately behind the spreader and before passage of the mechanical float finisher. Although stones caught by the finisher blades occasionally bent dummy joint steel slightly out of a straight line, the steel remained vertical and structurally good joint conditions were maintained

A piece of canvas was dragged on the last pass to iron out any slight surface markings left by diagonal blades of the machine



sisted of 52 men in addition to grade, carpenter and labor foremen as follows:

3 blade operators
24 truck drivers
1 dozer operator
4 tractor operators
1 tamper operator
1 shovel operator
1 machine operator
1 roller operator
1 form setter
1 crusher operator
1 water truck driver
1 crane operator
1 batch plant operator
4 cement finishers
1 cement finisher foreman
1 paver operator
1 truck mechanic
1 heavy duty mechanic
1 mechanic
1 master mechanic
1 spray machine operator

This project's high unit bid prices reflect continued high wage rates and long aggregate haul in the region. The mechanics and skilled operators made $50 to $130 per week, with the master mechanic drawing $163 in one typical week including 45 hours overtime.

J. D. Thomas was superintendent for the Arizona Sand & Rock Co. and P. N. Syler was project engineer. Bernard Touhey is state highway engineer of Arizona.

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Colleges Planning Postwar Aviation Courses

Results of a survey of high educational institutions by the Bendix Aviation Corporation show that 307 out of the 455 American colleges and universities which replied are making plans for post-war courses in aviation. Responses to the survey showed that 237 colleges now teach some aspects of aviation, that 212 of these schools are definitely planning to continue or expand their curricula after the war and that 95 additional schools among 140 colleges which do not at present teach aeronautics are planning to establish post-war courses.

Bid Items on Arizona Sand & Rock Co.'s 3.84-Mile Grading and Paving Contract, U. S. 66 W. of Flaggstaff. Let April, 1944

Unclassified roadway excavation, 61,956 cu. yd., @	$0.78
Drainage excavation, 1,610 cu. yd. @	0.78
Structural excavation, 590 cu. yd. @	1.75
Overhaul, 4,879 sta. yd.	0.15
Imported borrow, 40,380 tons	0.81
Base material, 38,910 tons @	0.95
Sprinkling, 6,820 M gal. @	1.75
Rolling, 1,420 hrs. @	3.50
Conc. pavement, 49,568 sq. yd. @	3.05
Concrete, Class A, 172 cu. yd @	30.00
18" Plain conc. pipe, 99 lin. ft. @	3.50
21' Plain conc. pipe 460 lin. ft. @	4.00
Salvage and relay bit. mix from old road, on shoulders, road connections, etc. 5,978 t. @	1.45
Salvaging and stockpiling same, 780 t.	1.20
Cutback asph. (MC-2) for bit. mix. in place, 210 t. @	23.00
Screenings in place on rd. 500 t. @	5.00
Emulsified asph. for seal, 80 t. @	30.00

Arizona Sand & Rock Co.'s aggregate plant. The main bin compartments were for sand and large stone. Smaller coarse aggregate was supplied to the weighing hopper via the small V-shaped bin and chute added at the right. The truck crane is a shop-made rig combining parts from several makes of trucks and shovels. Even the cab and radiator are the work of Chief Mechanic Al Carter—see "name plate" on chassis!

Milwaukee Plans to Repave 63 Miles, Pave 64 Miles New

A six year post-war street paving program for Milwaukee, involving the expenditure of $12,000,000 to reconstruct 63 miles of worn-out streets in the more thickly populated section of the city and to build 64 miles of new streets in the outskirts where hundreds of new residences have been built in recent years, was proposed recently to the examining committee of the city board of estimates by R. W. Gamble, superintendent of street construction and repair. The program would get under way immediately after wartime restrictions are lifted.

The program contemplates an annual appropriation for the six years of $1,000,000 as the city's share of costs. Another $1,000,000 would be raised by special assessment levied against abutting property.

This is in addition to a general program, involving cash expenditures of $22,248,000 and was for new buildings, new bridges, new sewers, street widenings, playgrounds and other construction for which the city previously had issued bonds. The city has not used bond financing for street construction for 30 years.

Gamble has urged that the proposed new street construction fund be put on a continuing basis, so that it would not be necessary each year to re-appropriate unexpended balances to carry over into the next year. A continuing fund would assure greater efficiency in planning long term projects.

The Milwaukee program mentions four special classes of work:

Reconstruction of worn-out pavements, to include modernizing and widening of roadways by reducing the width of sidewalks; original pavements in outlying districts where real estate developments warrant; alley pavements where needed, and special construction of high speed, large traffic volume routes leading into and through the city to provide for increased highway traffic after the war.

The 184 miles of pavements built between 1905 and 1919 should have been rebuilt between 1930 and 1944, but only 63 miles were reconstructed.

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England's Highway System. — The highway system of England totals approximately 180,000 miles, of which about 27,000 miles are trunk highways and Class I roads. Class II roads total 18,000 miles, and the remaining 138,000 miles of unclassified roads comprise residential streets and country lanes.

Armor-coated town road, Connecticut, after several years of service

Connecticut's Farm-to-Market Roads

How town roads are progressively graveled, stabilized and armor coated under state-aid program

THE wagons of Connecticut pioneers traced a 10,000-mile quilt of local roads. In recent years, under state aid and supervision, two thirds of these roads have been bituminous stabilized and armorcoated, using low-cost methods developed by experience to fit the New England climate, terrain and traffic needs. About 4,000 miles of surface treatment and 200 miles of armorcoat were scheduled during 1944. Since Connecticut has no county highway systems all highways except those over which the State Highway Commissioner has jurisdiction are under the authority of the officials of the local political sub-divisions.

In towns this is a function of the Board of Selectmen, Superintendent of Roads and Bridges or Town Managers, where this form of government has been installed; while city streets are generally administered by Superintendent of Streets or Directors of Public Work usually appointed by the Mayor.

In 1931 the Legislature provided for annual allotment of three million dollars to be equally divided among the 169 towns, consolidated towns and cities and consolidated towns and boroughs to be expended under the supervision of the State Highway Commissioner "for the construction, reconstruction, repair and maintenance of highways which it is not the duty of the Highway Commissioner to maintain." This is known as the Town Aid Fund.

The use of these funds are extended to include bridges and structures incidental to highways and the law directs the Highway Commissioner to enter into agreements with the Board of Selectmen or other proper authority when they have been properly authorized by their respective towns "relative to location, construction, improvement or maintenance of highways," under the provisions of this Act. This yields $17,750 to each municipality.

Additional Million Annually

In 1941 the Legislature allotted a further sum of one million dollars annually also to be expended under the supervision of the Highway Commissioner for the improvement of unimproved roads. This fund is apportioned among the towns according to ratio of unimproved roads in each town to the total mileage of unimproved roads in the State and it is provided that the Highway Commissioner and the Board of Selectmen shall determine the number of miles of unimproved roads in each town. While no specific provision requires an agreement with respect to the expenditure of these funds the Highway Commissioner for obvious reasons insists upon such agreements and town meeting authority.

Note dense mat of stone chips. Armor-coat stone specifications call for 100% passing ¾ in., 90-100% passing ½ in., 40-90% passing ⅜-in., 0.20% passing No. 4, 0-5% passing No. 8

Some difficulty was encountered in arriving at a definition of "Unimproved Roads." However, after conferences with the Boards of Selectmen it was determined that roads not meeting the requirements of Type E-1 set forth in Public Roads Planning Survey Memorandum 326-1939 would be classified as unimproved roads.

A survey of unimproved roads is made biennally and all roads which have been improved since the last survey are eliminated, thus the allotments change from time to time as the status of the roads change. These funds are known as 190-F funds deriving the name from the section number of the statute under which they are authorized. They are also known as unimproved road funds.

A local road which has been graded, graveled and widened preparatory to initial RT-4 or MC-2 treatment

Force Account or Contract

All construction contemplating the use of both of these funds is under the supervision of the engineering section of the highway department and is carried on either by contract awarded after competitive bidding or by force account using labor and equipment furnished by the towns at rates approved by the highway commissioner. The determination as to which of these methods is to be used is made by the towns with the approval of the Highway Department.

Except in the larger communities where traffic is more concentrated, roads constructed with these funds are usually of locally available material, generally gravel, since considerable gravel of acceptable quality for this type of road is well distributed throughout the State. The line and grade as well as the width is determined by the estimated traffic the roads are expected to serve. However, 16 ft. of available travel path is the minimum recommended in order that two lanes of traffic may be afforded. Subsequent maintenance usually provides 2 or 3 ft. of additional width.

Some towns in order to get the best possible results from their state allocations prefer to do the rough grading at their own expense. This affords local employment during the slack season and is accomplished on a piece meal basis. Roads which are thus graded are subsequently shaped and graveled with town aid funds. After contracts have been completed the roads are eligible for maintenance under Town Aid and this is carried on by force account of using town labor and equipment at prices approved by the Highway Commissioner.

How Bituminous Mat Is Developed

Many of these roads are traffic bound and they are allowed to remain without bituminous treatment until they have become well consolidated, after which they are lightly scarified and scraped to restore proper cross section and to loosen the surface sufficiently to permit proper penetration of the bitumen. Roads which have been rolled are dragged with a wire brush for the same purpose. For bituminous material we have used RT-4 and MC-2 which is applied at the rate of from ¾ to 1 gal. per sq. yd. and covered with sufficient sand to take up any excess bitumen. This is immediately dragged with a wire brush until the bitumen has been thoroughly incorporated with the road surface material and brought to a true cross section.

This results in a bituminous surface about 1-1½ in. in depth. The road is then opened for traffic and allowed to remain until light ends of bitumen have disappeared, usually 3-4 weeks or longer depending upon the climatic conditions. After this curing period, a second application of about ⅓ gal per sq. yd. is then applied, sanded and dragged as before. During periods of low temperature experienced in the Fall and Spring, RT-3 may be substituted for RT-4.

Retreated and Armor Coated

Subsequently, at yearly intervals or there abouts, a further application of 1/5 to ¼ gal. of bitumen of somewhat higher viscosity is applied and sanded. This is then dragged with a steel-shod 3-bladed wooden drag, thus restoring any loss of contour, and providing a seal coat. Any failures which have developed are corrected before this application is made. RT-5 and RT-6 have given very good results when used for these re-treatments.

When the road has been properly stabilized by the above treatment, usually about the third year, a special treatment locally termed "armor coat" is applied to provide a durable wearing surface which is self-cleaning and eliminates the inconvenience to travel attendent to tar or asphalt and sand treatment. Armor coat consists of an application of ¼ to ⅓ gal. per sq. yd. of asphalt cut-backs, either MC-5 or RC-5, after the surface has been thoroughly swept. This is covered with 25-30 lb. per sq. yd. of ½ in. trap rock evenly distributed and rolled with a 6-ton, 3-wheel roller to insure that a maximum amount of stone is brought into contact with the bitumen. There are some variations of this treatment, such as the use of asphalt emulsion of high viscosity, also the substitution of screened gravel or pea stone instead of trap rock. Very good results have been obtained when these materials were of proper grades.

Amor coat roads may be expected to give 8-10 years of service with very little maintenance. At the end of which period a second armor coat treatment may be applied.

Town Lays Out Work

Each town lays out its own treatment work, takes bids on tar and orders delivery as wanted, usually 10,000 to 25,000 gal. at a time. This year, while there has been no shortage of tar or asphalt, town work has had to limp along with innumerable small delays. Shortage of gas has slowed up distributor operation in some instances, as have delays in rail car deliveries.

A typical town crew observed this summer was operating with one spinner-type chip spreader instead of two. Three men, all borrowed from other towns, were working back of the distributor instead of the desired eight, and six sand trucks were trying to keep up with tarring on a 9-mile haul which normally would call for ten trucks. One truck was being driven by the selectman from an adjoining town, while the local selectman was dividing his time between

Nearly four thousand miles of Connecticut's town roads were treated during 1944

the job and a manhunt among nearby farms.

Armor-coating cost runs 7c per sq. yd. in normal times and 9½ to 10c currently, including every charge except supervision. This is about twice the cost of an ordinary sand-tar surface treatment. Numerous roads thus armor-coated have served 7 to 10 years under light town road traffic. There has been little bleeding, and only infrequent surface failure, the latter fact being due to insistence on a well built gravel road having a good base and traffic compaction before stabilization and armor-coating.

Town roads that have been stabilized and armor-coated have averaged $35 to $40 per mile per year in surface maintenance cost. Total maintenance costs including roadside are kept low and the accident rate likewise by avoiding excessively deep side ditches. Many hundreds of miles of roads have little or no formal ditch, the narrow shoulder merging with the fence line or backslope.

The practice of requiring selectmen to refer to a town meeting the decision of which roads are to be improved has been most successful since it is obvious that the roads carrying the greatest amount of traffic will be the first voted for improvement, and we have found that school bus and mail routes have invariably been the first to be so improved.

The chief continuing objective of the state highway department is to encourage uniformity of practice among the various local authorities. Three state supervisors work out of Hartford. Under them are 24 inspector foremen on state pay. Foremen are picked and trained by the supervisors.

W. E. Hulse, state aid agent of Connecticut, directs the town aid program. William E. Cox is state highway commissioner.

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Atlanta Has 300,000 Sq. Yd. Hot-Mix Resurface Program

Atlanta this year is going ahead with an extensive resurfacing program covering sections varying from 325 to 9650 ft. on 26 different streets. Briefly the method is to patch and level where necessary, apply 100 lb. per sq. yd. of bituminous binder and 75 lb. wearing course, the total application usually running about 200 lb. The topping is a modified Topeka mix.

Contracts for nine streets totaling 33,126 lineal ft. of street were let up to July 7, and 56,000 lin. ft. additional work was pending, according to word from Atlanta's chief of construction, Clarke Donaldson.

Rochester Also Trying Thin Concrete Patches

A VERY dry vinsol resin concrete, made with ⅝-in.-max. crushed limestone and sand in a 7-sack, 3-gal. mix, is being used experimentally for surface-patching concrete pavement in Rochester, reports Commissioner of Public Works, August H. Wagener. Developed by H. Walter Hughes of the city's materials testing laboratory, the method used is as follows:

(1) Area to be patched, usually a piece of scaled pavement or a location where a high spot has been cut down, is prepared by thoroughly cleaning of dirt, loose scale or foreign particles. Any spots or edge areas too high to permit 1 in. minimum thickness of concrete are cut down with jackhammers.

(2) The dry mix is spread and leveled with the backs of hand rakes and a steel straightedge used as a darby.

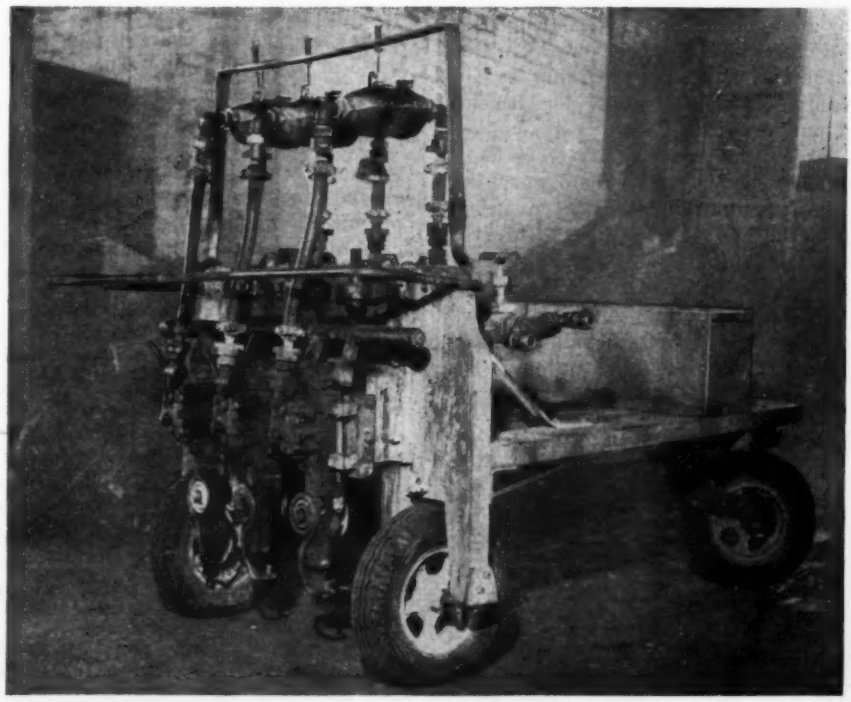
(3) Concrete is rolled with a 3½-ton tandem roller. The narrow roll involved in the average small patch results in actual rolling pressure of about 200 lb. per sq. in., or that equivalent to ordinary asphalt rolling pressures.

(4) Final finish is secured with a power float.

(5) Surface is then broomed and cured under wet sand.

Two details have been stressed in an effort to secure a durable patch. One is to get an even finish, the other is to get a type of finish that is correlated with the greatest tensile strength in bond with the old concrete. This surface seems to be one in which a minimum of course aggregate is exposed and which approaches a roughened mortar in finished appearance. To this end as well as to insured maximum density the materials are carefully controlled to secure minimum voids.

As a means of cutting down labor requirements, a special unit was devised and built of scrap materials by the city motor equipment division, enabling three jack hammers to be operated by one man. Powered by a single compressor (though air leads are provided for two) the machine consists of a rubber-tired towing dolly or cart, on which three jack hammers are mounted in vertical position. The hammers are held by collars bolted against the dolly frame. A 3-in. air manifold serves the three hammers. A compressor of at least 210 lb. capacity is required to operate.



How Rochester City forces rigged up three jack hammers, so that one man can operate them to cut down high spots or roughen areas of concrete preparatory to surface patching

Snow Removal Clinic

Notebook items from round table session at recent Public Works Congress, St. Paul

"In Eldorado, Kansas," reports Street Commissioner D. F. Golden, "we clear our wide 4-block main business street by putting all snow into the center with a motor grader and loading with a loader during the night. The loader used consists of a small wheel tractor equipped with a home-made front-end loader of ½-yd. capacity. This loader was devised from salvage parts of various machinery including a Chevrolet transmission. A 3-yd. truck load takes 5 or 6 minutes."

* * *

Elevator Hooked on Grader

A somewhat different device was built by city forces to clear snow in Newton, Kansas, as reported by Max R. Dick, city engineer. It consists of an elevator built on one end of the blade of a patrol grader. Working on the principle of a dirt loader the elevator is designed to pick up windrowed snow as the grader moves along, the outfit cleaning up a 12-ft. strip. It loads on the left end of the blade. The machine was built only recently and is due for a try-out soon.

* * *

Washington, D. C., Bans All-Night Parking

A toughly enforced ban on parking between 2 and 8 a. m. has been a great aid to the snow crews in Washington, D. C., according to W. Xanten of the D. of C. department of public works.

Even though this city gets only an occasional snow, the great increase in parking brought a crisis until the ban was adopted. Enforcement is absolute. Cars are hauled away if parked past 2 a. m. Initially 85 miles of arterials out of 915 miles of city streets were listed, and this mileage has been gradually increased. These streets are now plowed to the curbs. Main highways are first opened by plowing and dumping into side streets. Then side streets are opened and necessary loading done.

Previously wholesale snow loading was tried and the city purchased "one each of every kind of loader." Loading is still an important part of the job, of course. A small backfiller equipped with a 1½-yd. bucket in front takes up windrows at intersections. This unit can keep 6 trucks busy and is worth 30 shovelers.

Blower equipment is used on the basis that one blower plow can load out 30 trucks on a 3-block haul. Blowers concentrate on business centers while the 1½-yd. backfiller loaders work the outlying districts.

The city has installed five big snow-disposal manholes which are considered very successful.

Washington, D. C., incidentally, has underground electric railway power line installations. Salt treatment in winter is required to be kept at least three blocks away from lines.

Snow loader built by Dave Golden, street sup't, Eldorado, Kansas

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PRA to Make Field Tests of Nonrigid Bituminous Pavements

The Public Roads Administration is now preparing for field tests of nonrigid bituminous pavements under loads ranging in magnitude from those of automobile and truck wheels to those developed by the wheels of some of the largest airplanes.

The findings of this investigation will supplement the facts obtained in similar work with rigid-type concrete pavements during the thirties. The combined results will have special application in the design and construction of post-war highways.

The bituminous-pavement research will occupy only a small part of a 1,300-acre tract in Hybla Valley in Virginia about 10 miles south of Washington, D. C. This land was purchased by Public Roads Administration as a site for physical research to replace land in the immediate Washington area which has been taken over by other Federal agencies.

The layout for nonrigid pavement design research will include an oval track for both moving- and static-load tests, and an auxiliary pavement for static tests.

The purposes of the investigations:

1. To obtain, by means of field bearing tests on full-size pavement sections, fundamental data on the load-supporting value of nonrigid pavement of various thicknesses with respect to various base-course thicknesses and degrees of subgrade support.

2. To correlate the field data with appropriate laboratory tests, to determine whether the latter may subsequently be used by themselves in the design of pavements of the nonrigid type. The laboratory tests are already under way.

The research is being conducted in cooperation with the Highway Research Board of the National Research Council. There is also a cooperative arrangement between the Highway Research Board and the Asphalt Institute through which the latter organization participates actively in the investigation.

The auxiliary pavement will comprise three sections each 20 by 300 ft. having base course thicknesses of 4, 8, and 12 in., respectively. The wearing surfaces will be of asphaltic concrete 2, 4, and 6 in. in thickness on the 4-in. base, 2 and 4 in. in thickness on the 8-in. base, and 2 in. in thickness on the 12-in. base. Base courses will be placed on a natural subgrade uniform to a considerable depth.

The oval track will be constructed with parallel tangents, each with a paved surface 40 by 800 ft. and 10-ft. shoulders. For the first series of tests the tangents will be constructed with an embankment section providing a minimum depth of 5 ft. of selected material beneath the test pavements. The embankment will be built of a plastic clay obtained on the site and having properties not unlike those of a considerable amount of subgrade material throughout the country. On this embankment various thicknesses of base course and asphaltic concrete surfacing will be laid. While the broad program contemplates subsequent tests on other subgrade materials, the details of the future series of tests have not been settled.

Loads up to 80,000 lb. will be transmitted to the pavement, base, and subgrade through bearing surfaces 6, 12, 18, 24, and 30 in. in diameter or equivalent area. One of the bearing surfaces will be a pneumatic tire. Another may be a rigid plate. Still another may be a flexible surface designed to provide a uniform intensity of pressure and a constant area. The question of what bearing surfaces to use for the tests on the oval track will be decided by data obtained in testing in the laboratory and on the auxiliary pavement sections.

Surface Consolidation of Gravel Roads Cuts Maintenance Costs

By J. S. SCHMIT
County Highway Engineer, Stearns County, Minnesota

IMPROVEMENT of maintenance methods on Stearns County gravel roads has not only resulted in improved highways but an actual cut in maintenance costs.

In 1940 when we started our program of improvement of surface consolidation and calcium chloride treatments for our gravel roads, our blading cost was $32,598.76 for 750 miles. In 1943, our blading costs for 813 miles was $28,391.64. Thus, we bladed 63 more miles of gravel road but the cost was $4,207.12 less!

Before we set up our maintenance on a program basis, we had many types of surfacing and as many types of maintenance for their upkeep. It was a case of always trying to catch up by doing a little here and a little there and never really doing a satisfactory job.

Looking toward standardizing the gravel roads in our system, we chose the method of surface consolidation, because it can be done in large part through our regular maintenance by merely controlling and adjusting the new replacement materials normally required. It also utilizes local soil-aggregates, and no special or expensive equipment is needed.

Method of Surface Consolidation

The first year we completed surface consolidation with calcium chloride on 20 miles of road and the results were so satisfactory we have been gradually extending this program until we started 1944 with 130 miles of consolidated roads. We treat 40 miles of these consolidated roads with calcium chloride, especially on those roads which have the heavier traffic where we might lose considerable gravel through ravelling and dissipation of fines and binder materials through dust.

A tightly-bound soil-aggregate mixture was our aim. The amount of new material we had to add, of course, depended upon what we had left on the road. In some cases, we provided a good wearing course by consolidating as little as 2 in. in depth. In other cases, we had to consolidate as much as 6 in. It all depended upon the soil conditions we found present.

J. S. Schmit

At first we crushed aggregate material down to a maximum of 1 in., but top size was eventually reduced to ¾ and ⅝ in., because the smaller top sizes were shaped easier and needed after that a minimum of blading.

For binder, we used a sandy-clay on most jobs because it blended more easily into the aggregate. But where the sand was unusually fine, we found a sticky clay proved to be the best binder. If we went too high on clay at times, resulting in a slippery condition in wet weather, we blotted up this slick by adding a coat of sand.

After shaping of the consolidated material, calcium chloride is applied to the surface of the roads at the rate of 1 lb. per square yard. Subsequent applications are at the rate of ¼ to ½ lb. per square yard. The best technique, we believe, is to make light applications of the flake at necessary intervals when the road surface shows signs of dryness. On roads where we consolidated but did not continue calcium chloride treatments, ravelling and dusting followed. That is why on the heavier traveled gravel roads we use the calcium chloride to sustain consolidation of the surface.

Gravel roads, consolidated and treated with calcium chloride, show a negligible loss of gravel. Since adding gravel every year means considerable expense, the saving of this material by calcium chloride treatments is real economy.

The drastic cut in blading costs on consolidated roads plus the saving of gravel which would otherwise ravel or dust off, amounts to giving all county roads more attention and therefore better surfaces for the riding public, at no greater cost.

Blading Costs Before and After Consolidation

A few examples of what this method of road improvement accomplishes are given at this time, with special emphasis on blading costs.

The costs also take into account the fact that the motor patrol or blading crews were working at an hourly rate of $1.90 in 1939 and $2.15 in 1943.

	Blading Costs Before Consolidation	Blading Costs After Consolidation with Calcium Chloride
State Aid Road No. 5; length 9 miles; daily traffic, 200	1939—$1,183.25	1943—$457.95
County Road No. 53; length, 2.5 miles; daily traffic, 700 (summer)	1939— 164.15	1943— 98.90
State Aid Road No. 11; length, 6.5 miles; daily traffic, 265	1939— 470.60	1943— 142.97
State Aid Road No. 10; length, 2.5 miles; traffic, 150 daily	1938— 239.40	1943— 141.75
State Aid Road No. 3; length, 10 miles	1937— 783.83	1943— 389.15

(Left) Application of Sand Blotter Coat. (Right) Road along Lake Koronus carries 700 vehicles daily in summer

JOB and EQUIPMENT IDEAS

Labor and time saving job kinks and interesting construction features, noted by R & S editors in their travels or sent in by readers. Send in your suggestions with sketches or snapshots.

Fast Little Pick-Up Trailer

One of the handiest pieces of equipment on Lane Construction Company's CAA airport job at Martinsburg, W. Va., was this light trailer. It is built around four auto wheels and has a tongue and clevis designed to grab onto most any car or truck "going its way." The load pictured includes a barrow, fuel drum, spray unit, and one worker.

Truck Blade Dozes Fallen Rocks

Removal of rocks falling onto the highway during storms is one of the continual jobs of the California Dist. I state highway maintenance force at Eureka. This is a big district, taking in the famous Redwood Highway and other roads through rough country.

Removal of slides and very large isolated stones takes shovel work and the district has eight shovels. But smaller boulders are often nosed off the road by means of blades mounted in front of the patrol trucks. The blade, built in the district shop under Foreman E. R. Quitall, equipment supt. William Pierce and maintenance engineer Cameron, is supported by chains leading to an arm which pivots over a frame mounted in front of the radiator. The rear end of the pivot arm is raised—thereby letting the blade down to just clear of the ground—by means of a cable leading under the chassis and back to a drum connected with the dump body hoist. The blade is raised for travel when the hoist is down, and lowered for dozing by simply raising the bed. A. M. Nash is dist. engineer.

Pusher for Trucks—A Bet Often Missed

Nothing new or sensational in the idea of helping heavy trucks up a grade, but the ROADS AND STREETS editors see three places where it would pay for every case where pushers are used. This scene, snapped on the Louis Garavaglia & Son's contract, Detroit's Industrial Highway, shows a heavy tractor helping big whoopin' loads of slag up a 12% ramp, where the material was being dumped as back-fill behind a railroad bridge abutment. Note the sideboards on truck.

Skyscraper Manhole on Cleveland Access Project

CONSTRUCTION in 1944 of a section of Clinton and Ridge Roads, serving the Navy diesel training school and General Motors diesel engine plant near Cleveland, Ohio, involved building about 2,000 lin. ft. of 72-in. sewer in tunnel. The tunnel lines had to go unusually deep in order to meet topographical conditions and give drainage to nearby factory sites. Two and three ring brick construction was adopted for the sewers, whose elevation varied from 20 to 80 ft. underground. Sewers were bid at $60 and $70 per lin. ft. in place, the work involving excavation through solid shale except near the upper end, where shale occurred below the spring line. There liner plates were used to hold up a shaky clay roof.

Of principal interest on this job was the use of a manhole structure 75 ft. deep. Shown in the accompanying sketch, it was built at a point where the tunnel line drops some 30 ft. to a lower level. A feature is the use of five semi-circular granite baffles supported by reinforced concrete beams. The Kalill Company, Cleveland, who held the contract, included a flat item of $5,500 for this structure in place. Construction of the deep manhole was complicated by the fact that completion was delayed until after water had been turned into the sewer. A lined shaft was sunk to the depth of the shale. After completion of the concrete floor, the wall became a straight brick job, taking a bricklayer and 5 helpers 18 days. The 17-in. wall was stepped in to 13 then 9 in. near the top. The entire inside and outside faces were given a ½-in. coat of mortar and the lower half encased in lean concrete inside the shaft. Permanent steps of ⅞-in. wrought iron were inserted in the wall.

Following are the quantities and labor items required by the Kalill Company for this manhole, as furnished by H. T. French, asst. div. engineer of construction, and Robt. E. Willems, division engineer, Ohio State department of highways, Cleveland:

Excavation:

12 ft. x 12 ft. for 45 ft., 11 ft. x 11 ft. for 30 ft. earth and 20 ft. of shale.
Overflow tunnel, 30 ft.
Open cut, 26 ft.
Flume, 24 in., 16 ft. long (steel pipe).

Labor:

1 engineer, 26 days; 1 oiler, 26 days; 4 laborers, 26 days each.

Material:

6 boxes of dynamtie; 2,000 ft. of fuse; 300 caps; 12,000 B. ft. lumber.

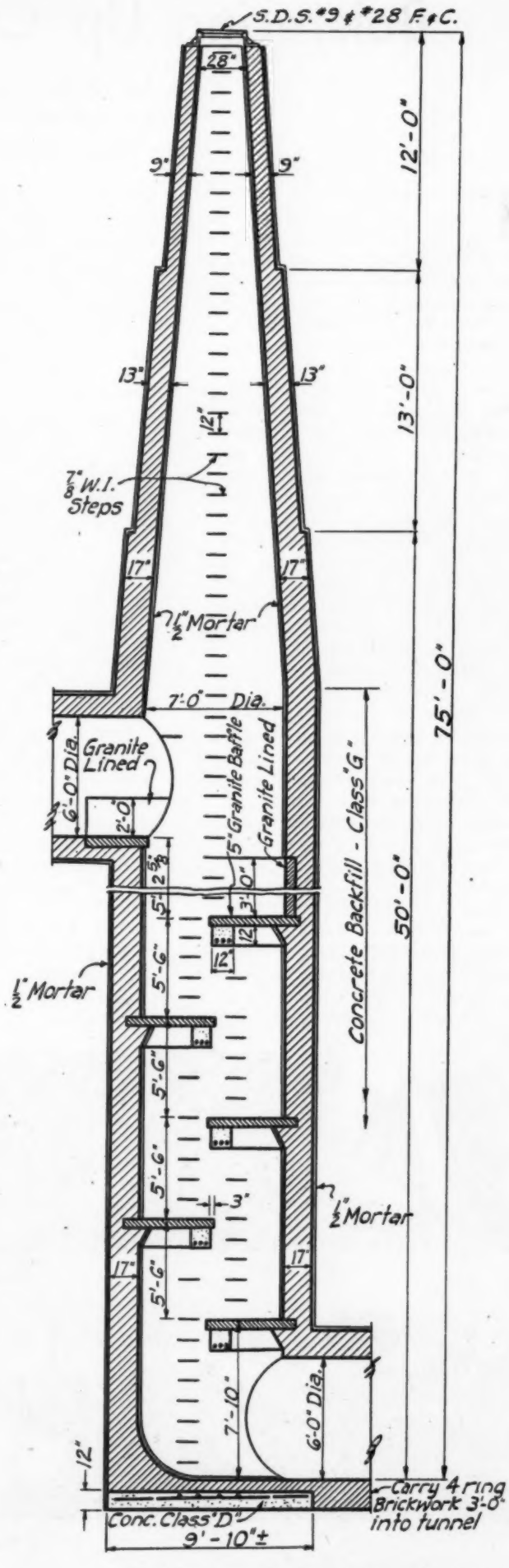
Construction:

Labor:

1 bricklayer, 18 days; 4 bricklayer helpers, 18 days each; 1 operator, 18 days; 1 oiler, 18 days.

Material:

46,500 sewer shale brick; 376 sacks of cement; 58 tons of brick sand; 52 cu. yds. concrete; 5 precast R. C. beams; 5 granite baffles; 500 granite blocks.



Sue 4,000 to Speed Superhighway

The City of Chicago took a step forward today toward making the long-dreamed-of $42,000,000 Congress st. superhighway a reality.

Condemnation proceedings, authorized Oct. 18 by city council, were started in Circuit Court against about 4,000 known and unknown owners of 230 pieces of property between Desplaines st. and Ashland av.

Acquisition of these will clear the way for the beginning of work, as soon as possible after the war, on that part of the highway to the west of the "Loop."

Bolstering Up Old Small Bridges

A lot of little commonplace repairs, but important in Indiana's wartime "Make it do" program

THE war caught the average county and state highway department with a long list of small bridges that needed repairing, widening and replacement. Shortages or no shortages, ways and means have had to be found to either bolster up many of these structures or else barricade them.

The accompanying photos and case notes on how typical secondary road bridges were widened or temporarily repaired are taken from the recent files of N. F. Schafer, superintendent of maintenance, Indiana state highway commission.

Case 1. (Fayette County, Ind.)

1 span 39-ft. 0-in. Pony Truss, Rdwy. 14-ft. 0-in. Concrete floor. The south truss was badly damaged by a truck and was removed. The north truss is acting as a hand rail at the present time. Sections of old 36-in. boiler tubing were sunk 5 ft. below the bottom of the stream bed and filled with concrete to an elevation 2 ft. below top of tubing. I-beam columns were placed on top of concrete and up under floor beams and X-braced, forming steel bents under each floor beam. Concrete was then poured to top of tubing which anchored the vertical beams.

Case 2. (Madison County, Ind.)

Span 19-ft. 6-in. R.C. arch, widened with I-beams. The narrow old arch, located in a sag, created a severe traffic hazard. Condition was remedied by extending the concrete abutments and concrete floor carried on steel I-beams, giving roadway width.

Case 3. (Randolph County, Ind.)

Located on County Road and being used for detouring, was severely damaged by truck hitting end post. Span was jacked up and cribbed at first panel point. End post removed and taken to sub-district garage, repaired and replaced. Floor had sagged 18 in. Brought back to original elevation and the old structure is now in good condition for this type of construction.

Case 4. (Jay County, Ind.)

Pony truss span, 48-ft pin conn. One original diagonal failed under heavy traffic. Panel was reinforced by placing of additional diagonals with tumbuckles, using material salvaged from old bridge members that were stored at highway garage. The old eyebars were left in place on account of extra cost of removal.

Case 5. (W. of New Castle, Ind.)

Repair to third panel, north side from northwest corner. One of the pair of eyebar diagonals broke and it was necessary to make replacement, which was done by burning a hole in top cover plate and forming a loop bar to go around top pin. On account of sidewalk, two bars were required to loop around lower pin. These bars were 1-in. Repair seems very satisfactory. All material used was salvaged from old bridges brought to highway garage.

Case 6. (N.W. of College Corner, Ind.)

The old 5-in. concrete floor, reinforced with wire fencing, disintegrated and was removed. A steel bent with concrete footing was erected at center line of span. A 4-in. laminated wood floor (2 x 2 on edge) was then laid and about 1½-in. oil mat laid on the wood floor. New wood handrails were then erected which gave a roadway of 18 ft. Repair raised load limit from 3 ton to 12 ton.

Case 7. (Randolph County, Ind.)

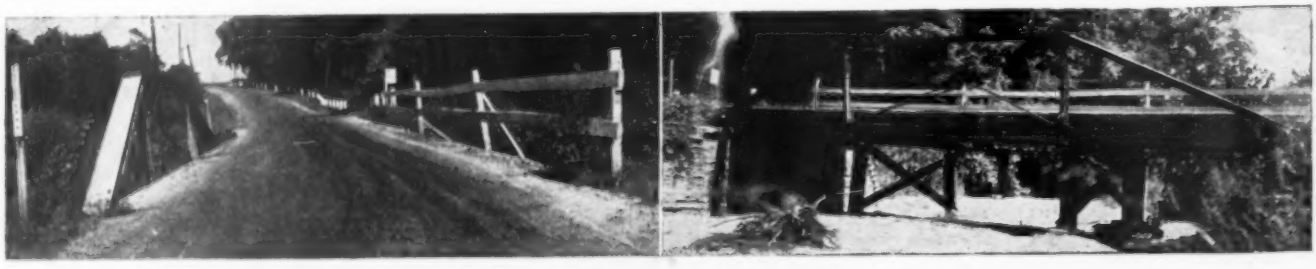
Stream-bed scoured below footing caused by recent heavy rains. Condition remedied by paving stream bed with concrete. Cut off walls installed at each end of pavement.

Case 8. (Franklin, Ind.)

Old 7-ft. stone arch culvert, 87-ft. long. The older portion was underpinned on both sides for a distance of 50-ft. Also all loose stones in side walls and crown were removed and repaired with concrete. A total of 20 cu. yd. of concrete was used.

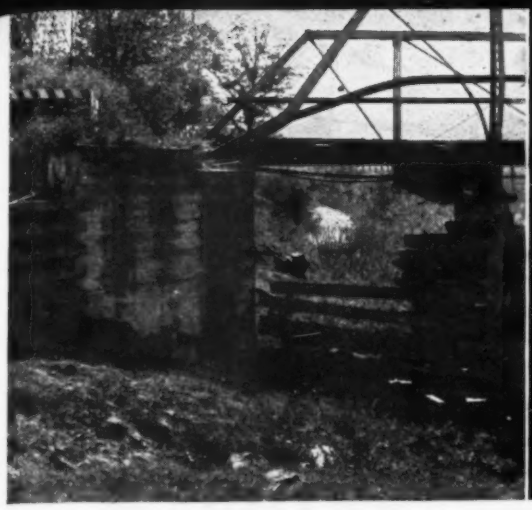
Case 9. (Grant County, Ind.)

Stream was dredged several years ago to 3-ft. below old footing. Abutments were sliding in and causing the southeast wing to crack off, and it was evident complete failure of abutments would follow. Condition is now being remedied by the underpinning of both abutments and rebuilding of new wing. The floor is being renewed.

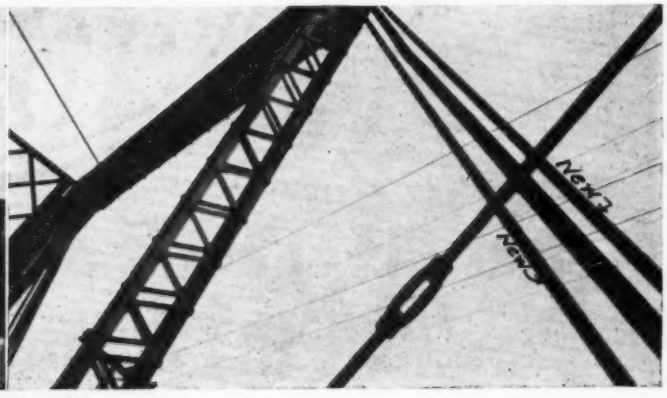


Case No. 1

Case No. 2



Cases Nos. 3 and 7



Cases Nos. 4 and 5

Case No. 6

Case No. 8

Case No. 9

Your CLETRAC dealer CAN HELP YOU Keep your Tractor Fit . . . or help you get a New CLETRAC for essential use

KEEPING your Cletrac fit . . . helping you get the most from your equipment . . . that's the aim of your Cletrac dealer.

He is proud of Cletrac's part in the war. Wherever there's a tough job of movement . . . bulldozing . . . building military highways . . . constructing airfields . . . moving wheeled vehicles . . . jockeying grounded warplanes . . . aiding Engineers and Seabee crews opening communication lines, and keeping them open . . . in scores of difficult jobs Cletracs are a vital part of the "sinews of war."

And on the home front, your Cletrac dealer is doing his utmost to help keep Cletracs in fighting trim so that the fighting fronts may be supplied with the materials of war.

Here's how your Cletrac dealer can help you:

1. Assist you in obtaining necessary repair parts, and supply trained, expert service men to aid you in maintaining your Cletracs for dependable, economical performance.

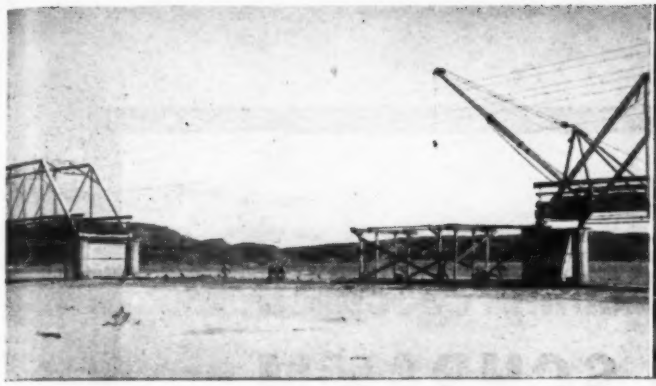
2. Aid you in securing new Cletracs for essential uses.

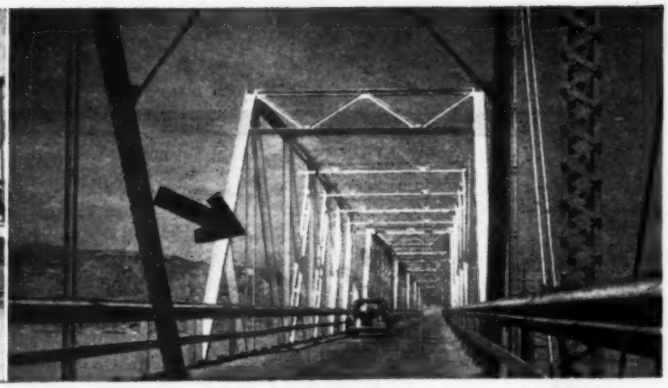
A substantial number of Cletracs are being released for essential civilian uses—allocated according to government regulations. Your Cletrac dealer will gladly assist you in making application for a new Cletrac if you can qualify as an essential user.

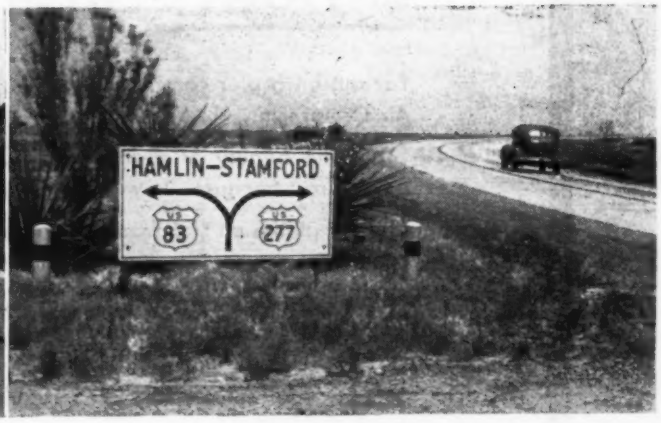
The folder illustrated at the right tells briefly of Cletrac's part in the war effort. A copy will be mailed on request.

THE CLEVELAND TRACTOR COMPANY • CLEVELAND 17, OHIO

CLETRAC *Tru-Traction* TRACTORS







How It's Done in Texas

Seen Along the Road

Useful ideas and practices noted on an inspection tour of the nation's biggest state highway system

Wartime Span Replacement "Almost Matches"

You guessed it—another end-post hit, and down she went. The bridge was a multiple 150-ft. truss bridge over the Southern Canadian River near Amarillo, one of those flat, "dry" rivers characteristic of the region; deep quick sand ruled out temporary piling. The state maintenance engineer at Austin, got the bad news Saturday noon, Sept. 25, 1943, and at once phoned a structural steel fabricator at Ft. Worth. Monday a. m. this firm visited the site and quoted on new delivered steel. Five more days and steel was estimated, odds and ends of adaptable structural shapes located and bought, and delivery to shop began. Amarillo state maintenance forces under district engineer Guy Lott put the span up. Opening: Nov. 3. No, the new span doesn't quite "match" the others, but who can be fussy in wartime?

* * *

One Way to Silt up a Roadside Gulch

It's simple—and not patented. You just put your waterway culvert through the embankment as usual, but dam the creek to any desired depth by surrounding the inlet with a well or riser as shown. This example, seen along Highway 6 in the Houston district (W. J. Van London, d. engr.) has resulted in depositing several feet of silt in 5 years' time. The farmer upstream gets water for his stock, so it's O.K. all around.

* * *

Four Lanes Over Hills

Several states have occasionally employed the design feature seen on U. S. 290 in West Texas, namely, that of going from 2-lane to 4-lane divided construction over sharp hills where sight distance isn't up to snuff. The Texas highway department resorts to this device, we understand, only where rock excavation would make for exorbitant cost of grade reduction on a road not carrying extremely heavy traffic. Well maintained center line markers are an important adjunct, since some folks still like to "venture into the unknown" by passing on blind hills.

Nice Straight Railing

"I want to stop and let you run your eye along that railing," said a Texas highway official as we crossed the 2700-ft. bridge over the Elm Fork of the Trinity between Fort Worth and Dallas. This indeed is an AA-1 job of forming and alignment, with a curb-edge as true as the rails on a streamliner route. No special tricks used here—just thoroughly braced forms and a construction crew that knew its stuff.

This bridge, built by R. R. Tway of Oklahoma City, in 1942, is on the Ft. Worth-Dallas "North Valley" highway largely completed before Pearl Harbor. After reopening the project three times WPB this year, incidentally, said O.K. and Tyree Bell's Texas-famed Road Company recently put down 10.2 miles of 2-lane concrete on one side of the dual r/w.

* * *

New-Type Directional Signs

Constant improvement of signs and marking on Texas state roads is one of the objectives of Mack Hodges,

Yes... you get compressed air anywhere with SCHRAMM

Far out on a pier construction job in the ocean . . . you find this Schramm Air Compressor.

That's the beauty of a Schramm. You're able to take the portable unit anywhere—because they are lightweight, compact, easy to tow about.

You get all the air you want. Never-failing service results from: 100% water cooled to prevent overheating and freezing . . . mechanical intake valve operating from cam in perfect timing . . . larger discharge valve with lower lift adding to efficiency . . . electric push button starter . . . forced feed lubrication . . . multi-cylinders and lighter parts.

Simplify your construction job by using Schramm Compressors. Write today for Bulletin SE-44.

SCHRAMM INC.

THE COMPRESSOR PEOPLE
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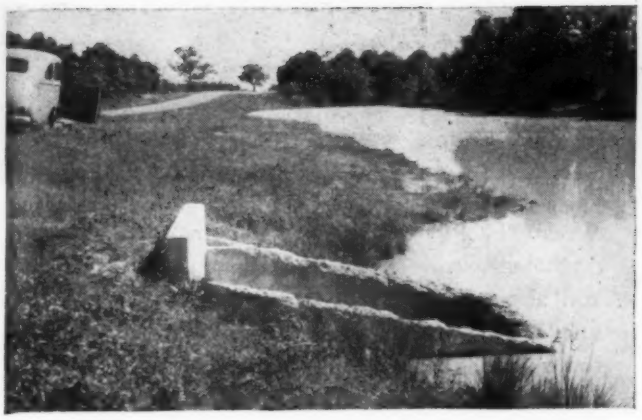
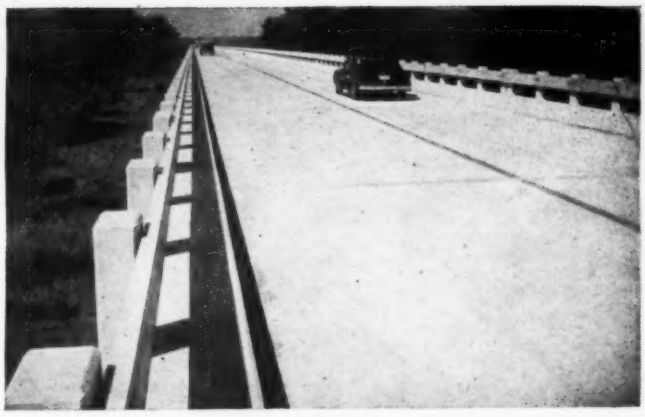
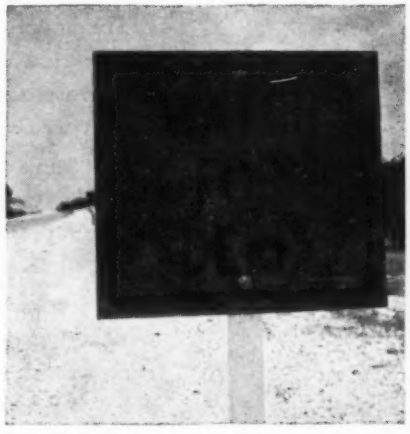




state maintenance engineer. "We probably made a mistake in the earlier part of the war period," he said, "in not stressing markers enough, thinking that a dwindling of tourists would lessen the needs for directional signs. On the contrary, the war brought an unprecedented number of out-of-state motorists—itinerant families of war plant and construction workers, etc. These folks were constantly getting lost."

In addition to adding or replacing numerous "Where are we going and how far is it" signs, the department has tried out a large-scale type of sign at junctions and intersections (see photo). The U. S. shield and lettering are larger than standard. Public reaction has been quite favorable.



After the war the department plans to issue a revised sign manual for its 25 state highway districts. Practically all signs are to be replaced with larger designs, reflectorizing buttons or beaded materials used much more extensively—all following AASHO standard shapes and designs, of course.

* * *

Speaking of Mack Hodges, he snapped this deer sign, which is a familiar type of road marker in West Texas. It's no joke when a car and a plunging critter collide on the highway; often fatal to both parties. Your editor had the experience in that way of narrowly missing a coyote.

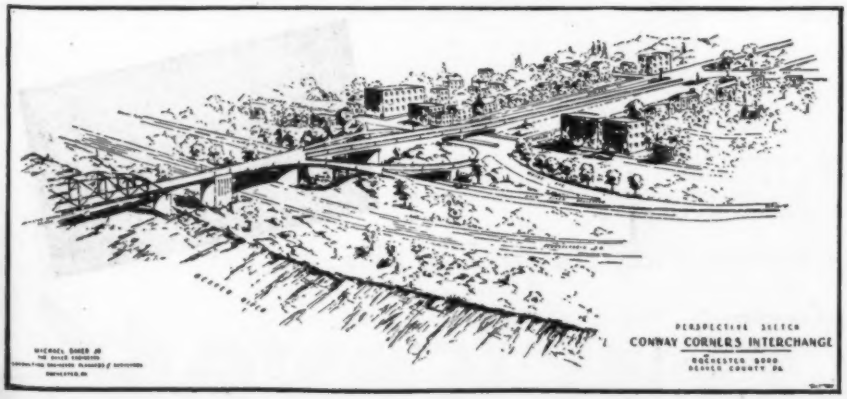
Pennsylvania County Has Big Post-War Proposal

POST-WAR plans for Beaver County, Pa., immediately northwest of Pittsburgh, may include expenditures of $6,800,000 on highway improvement, grade separation, and new and improved bridges, providing nearly 1,500,000 man-days of work under a 5-year public improvement program received recently by the Commissioners of that county.

Under Beaver County's bold "blueprint for tomorrow," prepared by Michael Baker, Jr., civil engineer, Rochester, Pa., the highway improvements, grade separation projects and new and improved bridges proposed are part of a program outlined in Beaver County's Planning Report.

The entire private and public improvement program calls for an expenditure of approximately $52,000,000 and would provide 3,000,000 man-days of work, if all of the proposals are adopted by the various local communities, the County, State and Federal and private agencies.

In addition to the 5-year program, another long-range "without time limit" improvement program, including the shorter one, is proposed, calling for the spending of nearly $63,000,000 for highway betterment, grade separation projects and new and improved bridges, which would provide 7,350,000 man-days of work. Sources for funds to carry out this highway and bridge construction program would be forthcoming from County, State, and Federal aid.



SMASHING A BOTTLENECK: As part of the 5-year $52,000,000 post-war improvement program outlined in Beaver County's "bold blueprint" for tomorrow one recommendation is an interchange for Conways Corners, now the worst traffic bottleneck in the County. Such an interchange, sketched here, would permit the heavy flow of traffic from Pittsburgh up the Ohio River Boulevard Extension to continue unimpeded with interchange ramps taking local traffic off the main artery

▼

Maine Proposes $18,700,000 Program—The Maine State Highway Commission proposes an $18,700,000 post-war road and bridge program. The state has an unexpended balance of $10,239,000 in state and federal funds.

HOW TO OUTWIT "E. JUPITER PLUVIUS" with Buckeye Trenchers

When "E. Jupiter Pluvius," rain maker of ancient mythology, sends showers he has no respect for roads and airports. Rain falls everywhere. For crops, it's fine; but allowed to permeate black top or to saturate the subgrade under asphaltic or concrete roads or landing strips, it's bad medicine. Water is a powerful solvent; in addition it exerts a tremendous force in expanding upon freezing.

The importance of adequate drainage for roads and airports has been abundantly demonstrated. Where Buckeye trenchers had a part in the job, there has been a welcome absence of crack-ups and sink-holes.

You can't prevent storms, can't "umbrella" pavement; but you can get rid of the water that collects, through proper drainage, preventing destruction to paved surfaces.

Modernly designed, soundly engineered Buckeye trenchers are ideal for drainage work; so scores of contractors and highway engineers tell us. Now available under priority regulations; soon they can be had by all.

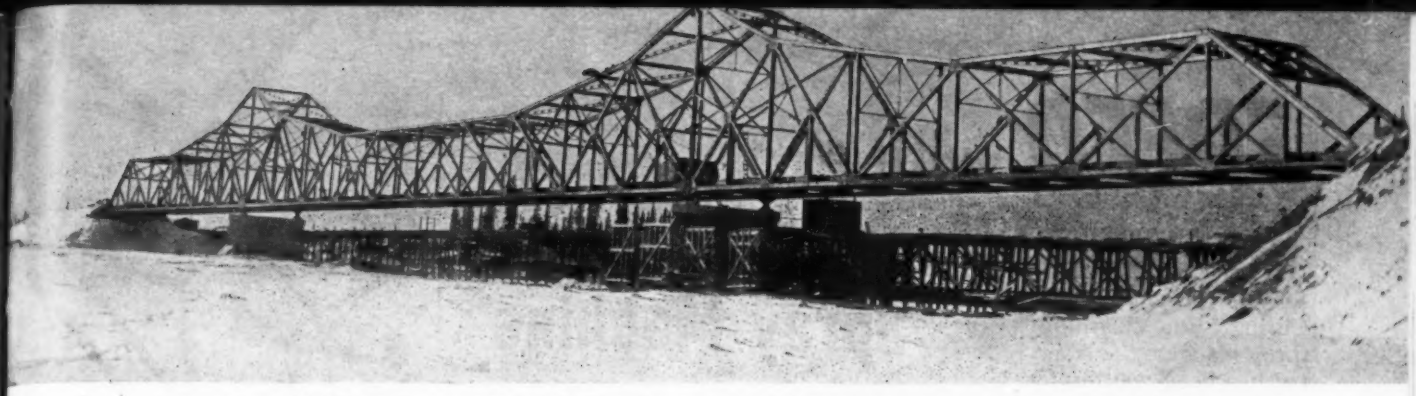
Model 120 digging herringbone laterals and roadside outfall trench on U. S. Route 22 east of Harrisburg, Pa. Rain won't bother this highway.

Fast, compact Model 120 Trencher digging lateral to outfall trench at Waterloo, Iowa airport. Note how the well balanced "120" crosses outfall trench without planking.

Buckeye Traction Ditcher Co., Findlay, Ohio

Built by Buckeye

Convertible Shovels Road Wideners Trenchers
Spreaders R-B Power Finegraders Tractor Equipment



Tanana River, Alaska. Erection complete and falsework removed. Work- trestle in view is on other side of bridge

Bridging the Tanana in Alaska

(One of the last permanent bridges to be completed on the Alaska Highway; footings supported on frozen substrata; travelers and towers used in falsework and steel erection.)

By R. W. MASON
Resident Engineer, Public Roads Administration, Federal Works Agency

DURING the 1943-4 winter a bridge crew of the U. S. Steel Export Company and bridge engineers of the Public Roads Administration worked in subzero temperatures and cutting arctic winds, to complete a large steel structure across the Tanana River on the Alaska Highway in Alaska. This is the last of a series of epic bridge construction jobs on this road, erected in defiance of subarctic winter and requiring great physical stamina and endurance.

As will be recalled, the pioneer road to Alaska, with temporary timber trestle bridges, was completed through the combined efforts of Army engineer troops and civilian forces in the fall of 1942. In the following winter, an unusually severe one, forces of civilian contractors worked on permanent bridges across the Peace, Kiskatinaw, Sikanni Chief, Muskwa and Liard Rivers.* It was certain that temporary bridges across these streams would be destroyed in the spring breakup and by summer floods. Permanent bridges were needed at the earliest possible date in the 1943 season for use in building the final highway. These bridges were completed in time to play an important part in the completion of the reconstructed highway in October, 1943. The entire roadway was completed, gave good service during the 1943-4 winter, and came through the spring breakup in good shape.

One of Last Built

However, due to delays in delivery of steel in Alaska, several of the northernmost bridges remained to be completed when the final highway was opened to traffic. One of these was the large steel structure across the Tanana River. Since it was reasonably certain that the temporary trestle across the Tanana would be taken out in the spring of 1944, it was decided to carry on work on the permanent bridge during the winter. This article reviews the construction of this bridge, which began in June, 1943, and was completed in April, 1944, before the ice broke up and without any delay to traffic on the highway.

The Tanana, one of the major rivers of Alaska, collects the drainage of a large basin lying to the north of the Wrangell range of mountains. It follows a meandering northwesterly course through the relatively flat, broad Tanana valley to join the Big Delta river south of Fairbanks and ultimately becomes tributary to the Yukon River at Ninana. Due to flat gradient, normal flow is sluggish and many sand bar deposits are present. However, during ice breakup and spring runoff of melting snow, often accelerated by heavy rainfall, flow is swift, scour results, and large amounts of ice and timber drift are carried.

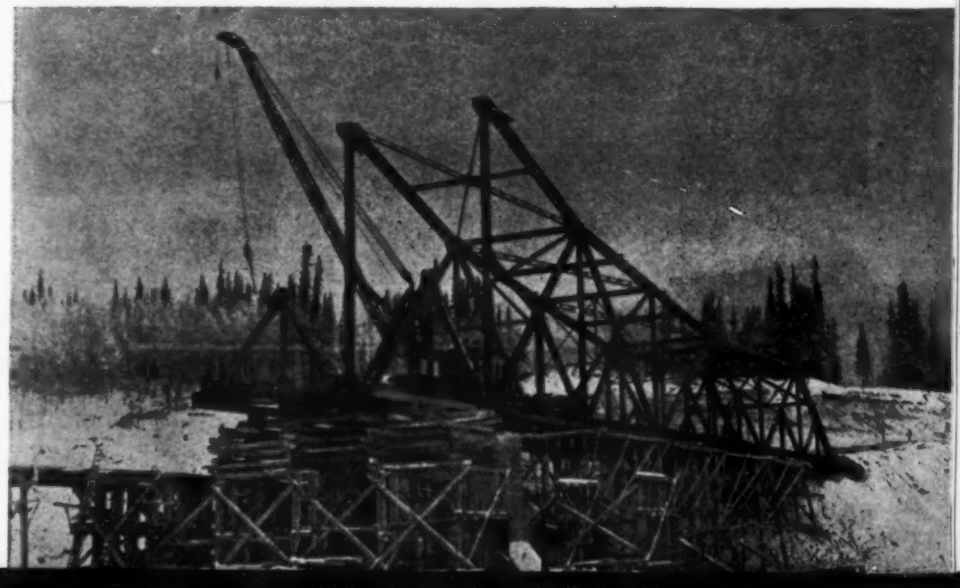
At Relocated Site

The initial crossing of the Tanana River was by means of a timber pile trestle constructed in 1942 by Army forces at a site on the pioneer tote road. Subsequent Alaska Highway surveys revealed a preferable crossing site some 8 miles upstream. This relocation allowed cutoff of nearly 7 miles in over-all travel and also placed the bridge at a site where a rock point on the east bank guaranteed permanence of channel limits.

The main portion of the initial timber trestle was carried away by ice and timber drift on several occasions during the 1942 and 1943 seasons, and further damage and closure of the road were prevented only by determined efforts of the maintenance forces. Experience with this trestle dictated that a steel span on substantial piers was necessary to assure permanency.

The span selected was a symmetrical 946-ft. cantilever through truss, having anchor areas of 258 ft. and a main channel span of 430 ft. with cantilever arms of 129 ft. and a suspended span of 172 ft. The structure has a 24-ft. roadway width between

One anchor arm erected. Note glimpse of parallel work trestle



*Article, "Alaska Highway Bridges," by Harold J. McKeever, "Roads and Streets," Dec., 1943, highlighted the 1943 bridge program on the road.

SPEED with Richkraft "Model A" Spray Machine

—With a Richkraft "Model A" Curing Spray Machine — the spray machine the Road Industry has been waiting for. Here is the answer to the demand from engineers and contractors for a *real* spray machine. Practical design—quality built—engineered for the job by men who understand the problem—not to be compared with "home made rigs" so often used for curing compounds.

The best materials give inferior results when applied with inferior equipment. They gum up in the machine, spread unevenly, waste time and money. There is none of this with a Richkraft "Model A."

Equipped with eleven spray nozzles of the newest, most efficient design, mounted on a 60" spray bar, the unit moves smoothly across the concrete, covering a five foot swath with each pass.

A closed windshield over the spray bar prevents loss of material because of wind — no suction, no air currents can distort the smooth spreading of an accurate film of compound.

Missed spots, flareouts, intersections are easily cared for by a hand spray with nozzle and 15 ft. of hose.

Look over the features at the right! Orders placed now will be handled at today's price for delivery before April 1, 1945.

We have a full line of machines from hand-operated units to the "Model A." Ask your Richkraft dealer about them. Write us if you don't have his name.

Four roller bearing wheels, complete with 60 ft. of pre-punched track for your bridge.

Hand spray with 15 feet of hose for missed spots.

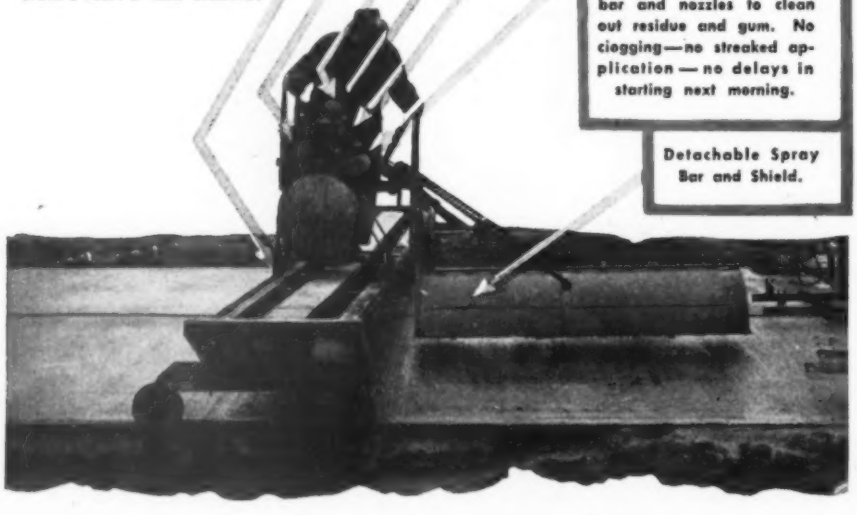
1½ H.P. Air Cooled Engine.

Quincy Air Compresser and 30 gal. tank.

Control valve on bridge with pressure gauge, material strainer, relief valve and all necessary connections.

MOST IMPORTANT OF ALL Two gallon "clean out tank" for naphtha. At the end of the day this solvent is blown through the spray bar and nozzles to clean out residue and gum. No clogging—no streaked application — no delays in starting next morning.

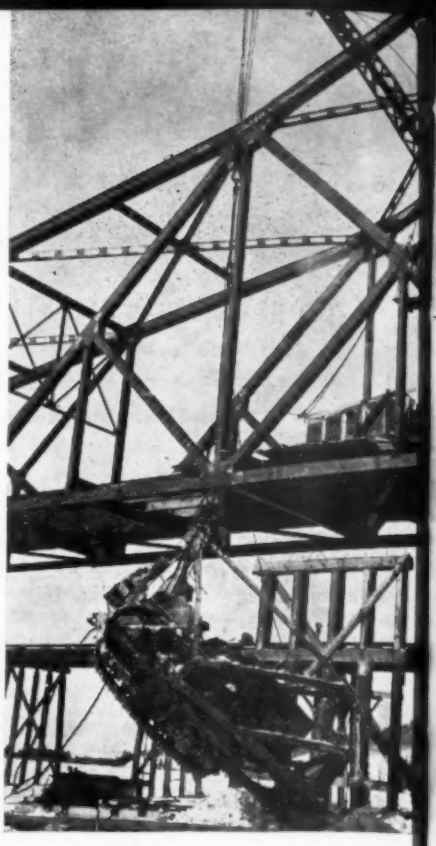
Detachable Spray Bar and Shield.



THE RICHKRAFT COMPANY

Builders Bldg., Chicago 1, Ill.
7 W. State St., Westport, Conn.

A Richkraft BUILDING PRODUCT



"Fishing" tractor out of the river after it had broken thru the ice

curbs, is on a 2% grade, and is designed for H-20 loading, AASHO 1941 Specifications. While the truss is designed for a concrete slab, it became necessary to substitute a timber deck for immediate construction.

Work started on the substructure June 23, 1943. The east abutment was located on the weathered granite rock point and was carried down well below the decomposed topping.

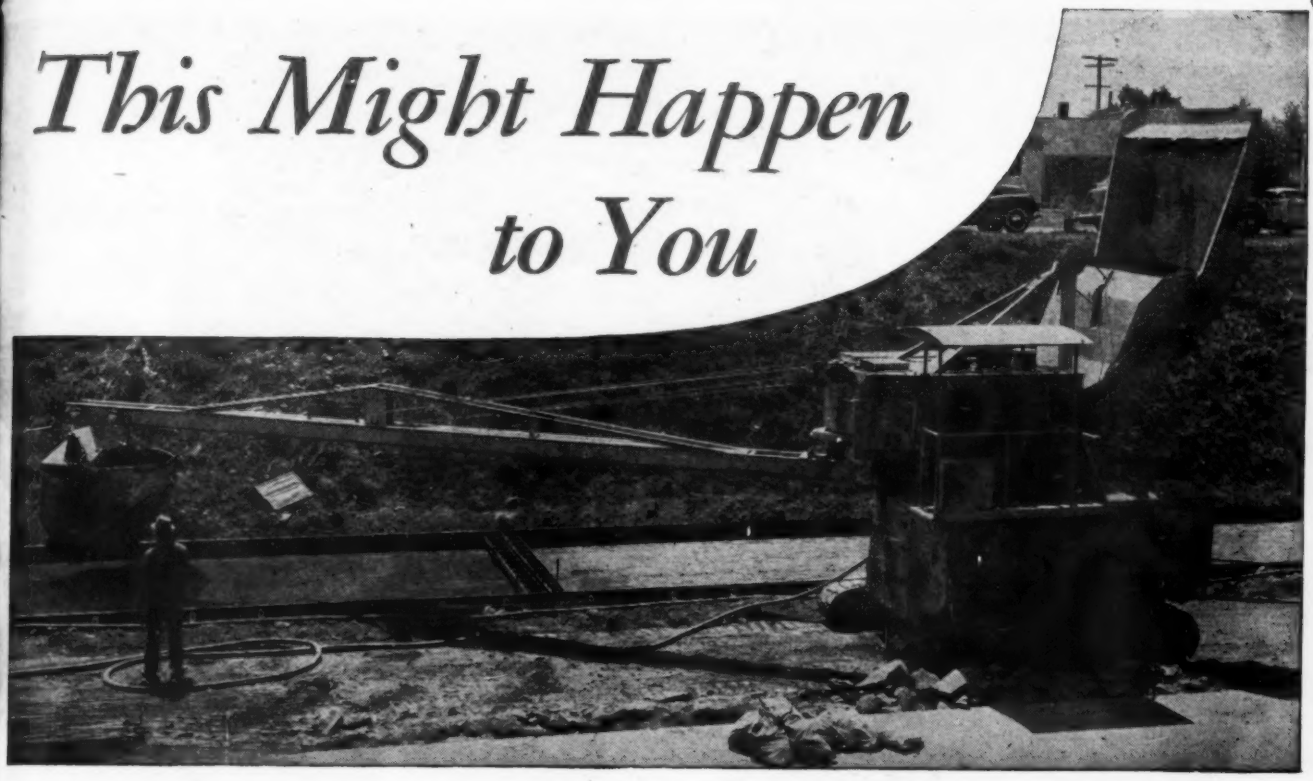
Footings on Perma-frost

The west abutment was located on the low bank-overflow side and in permafrost formation. As frost extended to a depth at least 35 ft. below the stream bed (test holes not carried deeper), it was decided to land on this material 20 ft. below streambed. About 18 in. of gravel was placed in the footing before placing the concrete to act as an insulating agent.

The river was only about 3 ft. deep at the west pier, due to the formation of a sand bar, and about 28 ft. deep at the east pier due to scour from the spring run-off. Steel sheet piling was used in the cofferdams with timber walers. Six-in. pipes filled with concrete were driven as guide piles for the deep pier. Excavation was made by both clams and sand pumps.

Concrete seals were placed with sufficient thickness to offset the hydrostatic head after which a reinforced concrete pier was carried to the bottoms of the truss shoes. Local concrete aggregates were obtained from a nearby pit.

This Might Happen to You



SNAP!!—a vital part just gave way on this important job. It looked like a 10 day delay if the part had to come all the way from the factory. The contractor faced a $600 rental loss and besides, the job would be behind schedule by some 3840 yards of concrete.

But thanks to a nearby A. E. D. member the part was replaced within 8 hours. The contractor lost only $60 rental cost and the job was set back only 384 yards.

Unexpected things like this happen to the best of machinery, but when they do, remember, the manufacturers have wisely made sure their machinery is distributed and serviced by reliable Associated Equipment Distributors. More than 500 A. E. D. members are ready to give you "Neighborhood Service" and have the proper facilities to repair or rebuild quickly and locally any piece of their equipment that gives way under extra wartime abuse.

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A recent survey shows more than $3,000,000,000 has been budgeted for post-war construction plans, underway or completed today.

To back your bid check these features of Blue Brute Compressors against any other brand.

Feather Valves*, simplest and most efficient, soothe maintenance headaches, lessen repairs and delays.

*Reg. U. S. Pat. Off.

Full force feed lubrication throughout engine and compressor.

3-point Suspension "cradles" both engine and compressor in one integral housing, cushioning shocks and vibration.

Check all their strong points. Then take your choice of models . . . truck-mounted, two or four-wheel spring trailer and skid-mounted . . . Diesel, gasoline or electric driven . . . and team them up with Blue Brute air tools for best results.

Ask your nearest Worthington Representative listed on page 000 what models of compressors and air tools best fit your needs.

PC4-27A

Behind the Fighting Fronts with BLUE BRUTES

On jungle roads and airports 'round the world . . . on Pacific Islands . . . on bomb-blasted roads speeding U. S. Armies toward victory, Blue Brutes are hard at work today . . . and in hundreds of factories, Navy Yards, air bases . . . on vital supply lines behind the fighting fronts.**

**Blue Brute Compressors and Air Tools are painted olive drab for the Army, battleship gray for the Navy.

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Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have always set the pace for easy operation — available in a wide range of weights and sizes.

WORTH receiving line
WORTHINGTO

Worthington Pump and Machine
poration Construction Equipment D
Holyoke, Massachusetts

Here Is Your Nearest Worthington Distributor

For Sales, Rentals and Service on BLUE BRUTE Portable Compressors, Rock Drills and Air Tools.

See full page ad page 80

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ARIZONA
Phoenix—Smith Booth Usher Company
ARKANSAS—Fort Smith—R. A. Young & Son
Little Rock—R. A. Young & Son
CALIFORNIA
Los Angeles—Smith Booth Usher Company
San Francisco—Edward F. Hale Company
CONNECTICUT
Hartford—The Holmes-Talcott Company
GEORGIA
Atlanta—Tractor & Machinery Co., Inc.
ILLINOIS—Chicago—Kennedy-Cochran Co.
INDIANA
Indianapolis—Reid-Holcomb Company
IOWA—Des Moines—Electrical Eng. & Constr. Co.
Davenport—Industrial Engineering Equipment Co.
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Blue Brutes

Worthington Pump and Machinery Corp.

The substructure was completed Sept. 27, 1943, just three months after beginning. Two separate crews and camps were operated one on each side of the river to expedite the work and work trestles were constructed out to each main pier from the shore.

The first structural steel arrived Oct. 8 but erection did not start until Nov 28, 1943, two months after completion of piers due to delay in delivery of the steel and erection equipment. It was decided to carry on steel erection during winter months in order to have a means of crossing the river in the spring when the ice would again take out the trestle.

Winter work performed with very little actual loss of time, although efficiency was materially reduced and costs mounted due to necessary protective measures taken.

Erection Traveler Drove Falsework Piles

Pile trestle falsework was used under each anchor arm. Piles were driven with the travelers which erected the steel, the reach being sufficient to drive the next bent ahead of the steel erected. Two erection gangs and travelers were used, on starting out from each shore.

The cantilever span was erected without falsework except that two movable towers resting on the ice were used for the first two panel points. All joints were pinned and bolted, and riveting was not started until the steel erection had been completed, Jan. 27.

The air for riveting was furnished by a 2-inch line from a large air receiver. This line had an "alcohol lubricator" placed next to the receiver which used about one gallon of alcohol per 10-hr. shift. Moisture traps were also installed.

Riveting actually began on Feb. 2, an average of about 400 rivets per gang and a high of 610 rivets in a 10-hr. shift were recorded. Riveting was carried on in temperatures as low as minus 35° F.

The winter was classed as a mild one and the worst sources of trouble were the winds which swept down the river and the frost forming on the steel. It was much more disagreeable to work in zero and 10° below with a wind whipping around than 30° below when calm. The wind seldom came up during the coldest days, which was a godsend.

A Few Mishaps

During steel erection, a tractor which was dragging piles across the river on the ice, broke through into about 15 ft. of water. It was "fished" out later.

No serious accidents and few frost bites were suffered. It was a tough job, but with proper precautionary measures taken, the erection and riveting of the 1,100-ton span was completed March 1, 1944. No painting was attempted during winter.

Temporary Timber Deck

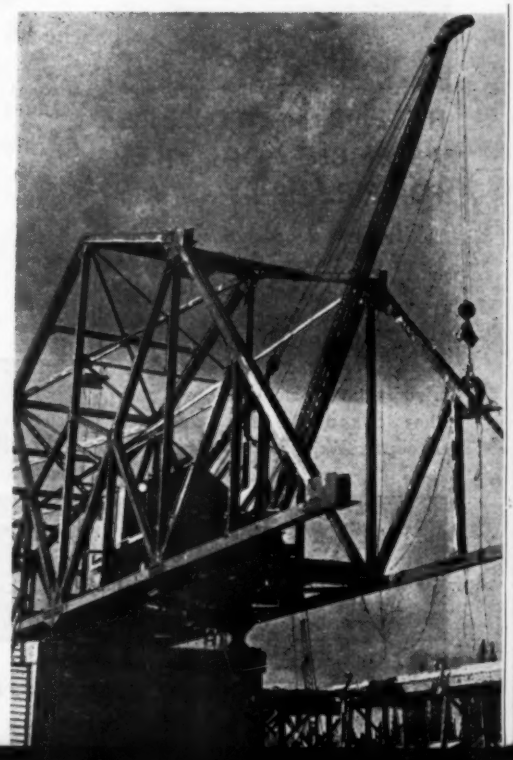
It was decided to place a timber deck rather than wait for concreting weather, as it was feared the ice would take out the temporary crossing and leave the highway without a means of crossing the Tanana.

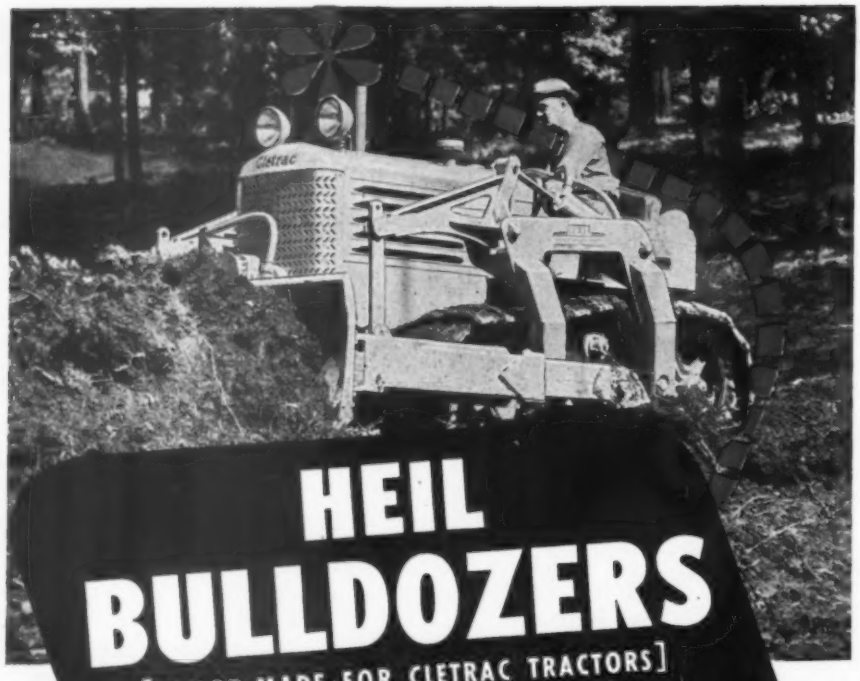
The contractor for the deck and painting moved in and began on March 1. The deck was finished after a slight delay due to temporary transferring of the men to another job on April 22, and the bridge was opened to traffic on that day.

Three contractors worked on this structure. Weldon Brothers Const. Co. of Iowa Falls, Iowa, completed the substructure, with E. Weldon as general superintendent. The American Bridge Company, of Pittsburgh, through the U. S. Steel Export Company, had contract to erect structural steel. M. J. Malley was their superintendent. Bates and Rogers of Chicago placed the timber deck and painted the structural steel under their contract, with Lee Bullen as superintendent.

The design and construction were under supervision of the Public Roads Administration in conjunction with the U. S. Army Engineers. R. W. Mason was Resident Engineer for the Public Roads Administration and later W. T. Brown, who was assistant, took over Mr. Mason's work.

Falsework under construction





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[TAILOR-MADE FOR CLETRAC TRACTORS]

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This Heil hydraulic bulldozer mounted on a Cletrac tractor is doing an excellent job in cleaning up the dock floor of a coal yard. The operator appointed for this job found the controls easy to handle, and in a short time could bulldoze a path that looked like the work of a sweeper. Write for full details

R-40

Note the operator's unobstructed view and the convenience of the controls that enable him to work accurately with no loss of speed. Heil engineers have pioneered the modern practice of replacing heavy cast members with welded box sections that are lighter, stronger, and easier to repair in the field without costly, time-consuming delays.

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THE HEIL CO.

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Cost of Mudjacking

During the past two years an extensive Mudjacking program has been carried on in District V of the California state highway systems. In all 13,839 holes were mudjacked. For the first 1,100 holes selected roadside material was used, the mud mixture consisting of:

Sand	1 cu. yd.
Cement	5 sacks
Diatomaceous earth	100 lb.
Water	56 gal.

This gave a combined weight of about 3,440 lb. per cubic yard. For the remaining holes the following mud mixture was used:

Sand	1 cu. yd.
Cement	5 sacks
Diatomaceous earth	32 to 64 lb.
Water	92 to 116 gal.
Plaster of Paris	50 to 100 lb.

This gave a combined weight of about 3,500 lb. per cubic yard. The plaster of Paris set up the mix in 15 to 35 minutes, while before its addition, several hours to a day was required before a set was obtained.

In areas with small voids better results were obtained by increasing the diatomaceous earth content to 64 lb. per cu. yd. and decreasing the plaster of Paris to 50 lb. This increased the water content necessary to 116 gal. per cu. yd.

When large voids were encountered, 32 lb. diatomaceous earth and 100 lb. plaster of Paris were used, which allowed traffic to move over these areas in a very short time without any visible effect on mud content.

Cost of Work. A total of 13,839 2-in. holes was drilled in 33 working days or an average of 419 holes per day at a cost of $0.20 per hole. The average drilling cost per day was $82.59.

Mudjacking these 13,839 holes required 50 working days or 276 holes per day at $0.82 per hole. The average filling cost per day was $227.50. For the entire work the cost of drilling and filling was $1.02 per hole.

About 3.74 cu. yd. of material was used per day and an average of 0.37 cu. ft. of material was forced into each hole. The variation was from 0.1 cu. ft. to 7.0 cu. ft. per hole.

Los Angeles Plans $25,000,000 Airport

Inter-city competition for post-war air leadership advanced another step recently in the announcement of plans to quadruple the size of the present Los Angeles airport. A $25,000,000 terminal with 7,000 and 10,000 ft. runways as against the present 4,400 and 4,600 ft. strips is contemplated.

Sepulveda Blvd. will pass under runways. The present 625 acres would be expanded by the Dept. of Public Works to take in 1844 acres more under a resolution adopted by the L. A. Municipal Airport Commission.

Air passenger travel in and out of Los Angeles has multiplied four times in the last five years and air cargo is five times as heavy.

"This is 'the' plan," Mayor Bowron emphasized at a conference with Oscar A. Trippet, chairman of the Citizens Advisory Committee; Robert L. Smith, president of the Municipal Airport Commission; Woodruff De Silva, Municipal Airport manager, and Thomas Tucker, airport engineer.

"It is not a postwar project," the Mayor continued. "We're going to move forward as quickly as possible so as to be ready for postwar business."

The new plans represent the culmination of years of study, with the airlines giving their top technicians leave of absence to assist. The airport will be able to handle 240 take-offs and landings per hour.

A 500-car garage and a 5000-car parking lot will take automobiles from one parkway paralleling the ocean and others linking the airport to Los Angeles and the harbor.

▼

ARBA Official Nominations, Officers for 1945 and Directors for Three Years

(Submitted by Nominating Committee)

President: James J. Skelly, Pres., James J. Skelly Co., Media, Pa.

Vice-Presidents: Paul B. Reinhold, Pres., Reinhold & Co., Inc., Pittsburgh, Pa.; W. A. Young, Cornell-Young Co., Macon, Ga.; E. R. Galvin, Pres., Tyson Bearing Corp., Massillon, Ohio; C. H. Purcell, Dir., California Department of Public Works, Sacramento.

Treasurer: H. C. Whitehurst, Dir. of Highways, District of Columbia, Washington, D. C.

Directors, term ending 1948: T. H. Cutler, Chief Engineer, Kentucky Department of Highways, Frankfort; E. S. Gillette, Editor and Publisher, ROADS AND STREETS, Chicago; O. S. Hess, Engineer-Manager, Kent County Road Commission, Grand Rapids, Mich.; H. C. Hofheimer, II, Pres., Highway Contractors, Inc., Norfolk, Va.; Theodore Reed Kendall, Editor, "Contractors & Engineers Monthly," New York, N. Y.; H. G. Sours, Director, Ohio Department of Highways, Columbus, Ohio; Carl O. Wold, Vice-Pres., Caterpillar Tractor Co., Peoria, Ill.

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Decorative chromium is put where it *will* show. But we put tons of chromium into cylinders of Diesel and gasoline engines where it *won't* show, although you *can* see the results in greatly increased engine reliability.

We use enough chromium in *one* year to chrome-plate the bumpers of every automobile built since 1932. Yet a 16-cylinder, 1800 horsepower Diesel engine needs only 240 ounces of PORUS-KROME to multiply its cylinder life four to twenty times.

PORUS-KROME, applied by the Van der Horst process, is highly resistant to abrasion and corrosion, and "wets" with oil. Experience in thousands of engines in ships, planes, tanks, stationary and mobile power plants, buses, trucks and locomotives shows that PORUS-KROME not only multiplies cylinder and ring life, but reduces scuffing, ring feathering and risk of piston seizure.

Right now, Van der Horst is busy on cylinders in engines for the war. However, it is not too soon for you to plan to have PORUS-KROME in your own engines. When Government restrictions are relaxed, PORUS-KROME will be available to you in new engines and also in replacement liners for existing engines.

Ask for PORUS-KROME . . . and be sure of greater engine reliability.

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Good for the Life of your Engines

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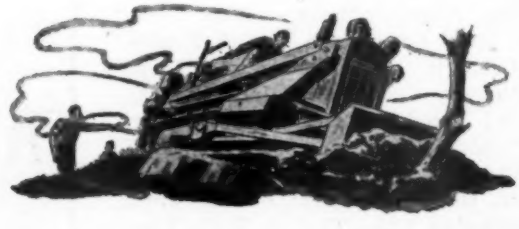

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AN AFFILIATE OF DRESSER INDUSTRIES

"Topeka Plan" Maps 76 Post-war Projects

By W. G. BALDRY
City Engineer, Topeka, Kansas

THE city of Topeka, Kansas, has a plan for post-war public works construction, developed under seven guiding principles which aid in determining priority of individual projects:

1. The bonded indebtedness for construction projects shall not be increased by more than $750,000 in the first year after the war and by an additional $500,000 in the second year.

2. With the exception of public roads funds, federal funds will not be accepted except for an extreme emergency.

3. Modern equipment will be used on all construction jobs in preference to made-work by hand labor.

4. The time of starting any construction work will be determined first by the need of taking care of unemployment, and second when the particular construction is necessary without reference to unemployment.

5. The order in which the projects are commenced will be determined first, by the need of the project and second, upon the readiness of the project.

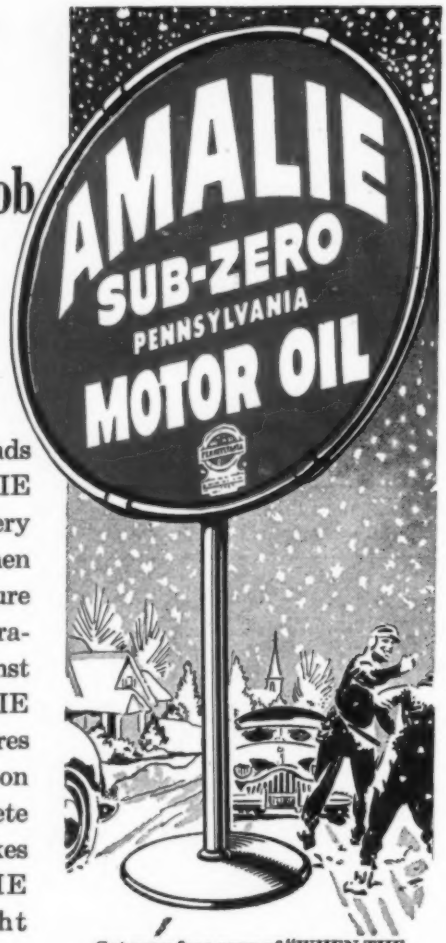
6. As to financing, preference shall be given, first, to the project that is financed by cash; second, to the project financed by bond issue; third, to the project requiring bond issue and election.

7. In the case of a project involving a benefit district, preference will be given to those projects, covering

TABULATION OF MUNICIPAL PROJECTS PROPOSED BY THE CITY OF TOPEKA KANSAS FOR POST-WAR CONSTRUCTION

NUMBER	TYPE AND LOCATION OF PROJECT	TOTAL COST	FINANCES: CASH	FINANCES: BONDS	FINANCES: ELECTION	FINANCES: PETITION	FINANCES: WHEN READY	PLANS: NO NEED	PLANS: NEEDED	PLANS: CITY MEN	PLANS: CONSULTANT	PLANS: TIME REQUIRED	FIELD WORK PRELIMINARY: NO NEED	FIELD WORK PRELIMINARY: NEEDED	FIELD WORK PRELIMINARY: TIME REQUIRED	LEGAL PREPARATION: NO NEED	LEGAL PREPARATION: NEEDED	LEGAL PREPARATION: TIME REQUIRED	RIGHT OF WAY: NO NEED	RIGHT OF WAY: NEEDED	RIGHT OF WAY: TIME REQUIRED	TOTAL TIME FOR PREPARATION: NOW	1 MO.	2 MO.	3 MO.	6 MO.	1 YR.	EMPLOYMENT: MAN HOURS	EMPLOYMENT: NUMBER OF MEN	EMPLOYMENT: HOW LONG	ORDER OF CONSTRUCTION	LEGAL AUTHORITY: REFERENCE
	ADMINISTRATION DEPARTMENT																															
1	FIREMAN'S TRAINING TOWER	13,082	X				NOW		X	X		1/2 MO	X			X			X				X					6,000	10	3 MO		
2	AIRPORT ADMINISTRATION BUILDING	150,000	X				NOW		X		X	3 MO	X			X			X							X		50,000	40	8 MO		3-113
3	PUBLIC LIBRARY	412,200	X		X		6 MO		X		X	4 MO				X				X	3 MO					X		120,000	60	10 MO		12-1201
4	NATIONAL GUARD ARMORY	159,400	X		X		6 MO		X		X	2 MO				X				X	2 MO			X				80,000	60	5 MO		48-308
5	AIRPLANE HANGAR	88,460	X				NOW		X		X	1 MO	X			X			X					X				40,000	40	4 MO		3-113
	WATER DEPARTMENT																															
6	WESTBORO MAIN	20,000	X				NOW		X	X		1 MO	X			X			X					X				13,000	10	10 MO		13-806
7	CHEMICAL STORAGE	100,000	X				NOW		X		X	3 MO				X			X						X			26,000	20	11 MO		13-2608
8	WELLS NORTH OF RIVER	85,000	X				1 YR		X	X		1 MO		X	6 MO	X				X	1 MO						X	30,000	20	10 MO		13-806
9	METER REMOVALS	100,000	X				NOW	X				NOW				X			X				X					40,000	6	36 MO		27-110
	STREET DEPARTMENT																															
	STREET SPRINKLING																															
10	TOPEKA - 17 TO 21	52,500	X				NOW		X	X		2 MO		X	NOW	X	1 MO		X	1 MO					4			17,123	30	3 MO		68-412
11	TOPEKA - 21 TO 17	96,600	X				NOW		X	X		2 1/4 MO		X	NOW	X	1/4 MO		X	1 MO					4			28,850	44	3 MO		68-112
12	TOPEKA - 17 TO 15	32,500	X				NOW		X	X		2 MO		X	NOW	X	1 MO		X	1 MO					4			9,201	22	2 MO		68-412
13	MONROE - 5 TO 6	10,870	X				NOW		X	X		1 MO		X	1/2 MO	X	1/2 MO		X					X				4,498	22	1 MO		13-1094
14	MONROE - 6 TO 7	11,849	X				NOW		X	X		1 MO		X	1/2 MO	X	1/2 MO		X					X				5,189	25	1 MO		13-1094
15	MONROE - 8 TO 9	11,849	X				NOW		X	X		1 MO		X	1/2 MO	X	1/2 MO		X					X				5,189	25	1 MO		13-1094
16	MONROE - 9 TO 10	13,610	X				NOW		X	X		1 MO		X	1/2 MO	X	1/2 MO		X					X				5,189	25	1 MO		13-1094
17	HUNTOON - BUCHANAN TO MULVANE	30,000	X				NOW		X	X		1 MO		X	1 MO	X	1/2 MO		X	1/2 MO				X				14,953	25	3 MO		13-1094
18	HUNTOON - BUCHANAN TO WESTERN	18,000	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X		6,994	32	1 MO		13-1094
19	HUNTOON - WESTERN TO TOPEKA	28,000	X				NOW		X	X		1 MO		X	1 MO	X	1/2 MO		X	1/2 MO						X		9,079	22	2 MO		13-1094
20	HUNTOON - MULVANE TO MACVICAR	41,000	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X		10,131	25	2 MO		13-1094
21	HUNTOON - MACVICAR TO OAKLEY	48,000	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X		13,528	30	2 MO		13-1094
22	SEWARD - BRANNER TO TWISS	45,699	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X		9,147	23	2 MO		13-1094
23	17TH - KANSAS TO TOPEKA	19,020	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X						13-1094
24	17TH - TOPEKA TO CENTRAL PARK	31,700	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X		36,473	50	3 MO		13-1094
25	17TH - CENTRAL PARK TO WASHBURN	31,700	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X						13-1094
26	17TH - WASHBURN TO MACVICAR	38,040	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X						13-1094
27	GARDOU - EMMETT TO POPLAR	10,200	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X		21,165	34	3 MO		13-1094
28	GARDOU - POPLAR TO OAKLAND	10,200	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X						13-1094
29	GARDOU - OAKLAND TO STRAIT	6,800	X				NOW		X	X		1 1/2 MO		X	1 MO	X	1/2 MO		X							X						13-1094
	REBUILD STREET IMPROVEMENTS																															
30	LOCUST - 4TH TO 10TH	26,530	X				NOW		X	X		2 MO		X	1 MO		X	1/2 MO	X							X		10,087	24	2 MO		12-675
	PAVING																															
31	21ST - BUCHANAN TO TOPEKA	45,606	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1 MO	X						X			34,367	41	4 MO		12-675
32	PETITION - BENEFIT DISTRICTS	100,000	X		X		1 MO		X	X		1 MO	X				X	1 MO	X						X			60,000				12-601
	SURFACE																															
33	MACVICAR - 6TH TO CROSS	16,300	X				NOW		X	X		1 MO		X	1 MO		X		X						X			4,060	20	1 MO		12-675
34	POPLAR - GARDOU TO DISPOSAL PLANT	19,610	X				NOW		X	X		1 MO		X	NOW		X	1 MO	X						X			14,634	35	2 MO		12-675
35	WAITE - THE DRIVE TO WALKER	10,360	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1 MO	X						X			2,596	12	1 MO		12-675
36	MACVICAR p 17TH TO 21ST	17,468	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1 MO	X						X			4,229	20	1 MO		12-675
37	MUNSON - CLAY TO WASHBURN	22,800	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1 MO	X						X			14,712	35	2 MO		12-675
38	WALKER & HAWTHORNE-WAITE TO DRIVE	10,120	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1 MO	X						X			2,658	12	1 MO		12-675
39	24TH, 25TH, 26TH-FILLMORE TO WESTERN	10,008	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1 MO	X						X			10,185	25	2 MO		12-675
	BRIDGES																															
40	21ST & SHUNGANUNGA CREEK	20,000	X				NOW		X	X		4 MO	X			X			X						4			12,500	20	3 MO		12-675
41	TOPEKA & SHUNGANUNGA CREEK	50,000	X				STATE		X			4 MO				X	NOW		X						4			31,200	30	5 MO		68-412
42	MELAN (KANSAS AVE & KANSAS RIVER)	100,000	X	X			3 MO		X		X	6 MO				X		4 MO	X								X	70,000	40	10 MO		***
	VIADUCT																															
43	10TH - JEFFERSON TO CHESTNUT	300,000		X			3 MO		X		X	8 MO		X	3 MO		X	4 MO		X	5 MO						X	2	130,000	75	10 MO		13-1094
	LEVEE OR DIKE																															
44	NORTH TOPEKA	17,000	X				ARMY		X			NOW	X		NOW		X	3 MO	X									X	200,000	200	8 MO		39-34 44
	STORM SEWERS																															
45	STRAIT & BELMONT TO KANSAS RIVER	39,400	X																													
46	STRAIT & BELMONT TO KANSAS RIVER	26,325	X				NOW		X	X		2 MO		X	NOW		X	1/2 MO		X	1/2 MO					X			31,203	30	5 MO		12-628
47	STRAIT & BELMONT TO KANSAS RIVER	30,598	X				NOW																									
48	Story & STORY TO WARD'S CREEK	3,060	X				NOW		X	X		1/2 MO		X	NOW		X	1/2 MO	X					X				1,325	6	1 MO		
49	9TH - OAKLEY TO FRASIER	22,500	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1/2 MO		X	1/2 MO			X					8,484	20	2 MO		
50	CRANE - GRATTAN TO SHUNGANUNGA CR	6,100	X				NOW		X	X		NOW		X	NOW		X	1 MO	X					X					2,191	11	2 MO		
51	KANSAS- 9TH TO 8 TH TO QUINCY	8,140	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1/2 MO	X					X					1,821	9	1 MO		
52	KANSAS- 8TH TO EAST OF KANSAS	2,976	X				NOW		X	X		1/4 MO		X	1/4 MO		X	1/2 MO	X					X					1,488	7	1 MO		
53	KANSAS - 6TH TO QUINCY SEWER	19,588	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1 MO	X						X				8,340	20	2 MO		
54	ATWOOD - 19TH TO 21ST	10,250	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1 MO	X						X				2,646	12	1 MO		
55	STATE - SUMNER TO SHUNGANUNGA CR	3,140	X				NOW		X	X		1 MO		X	NOW		X	1 MO	X						X				1,723	8	1 MO		
56	POLK - 2ND TO 5TH	31,518	X				NOW		X	X		1 MO		X	1/2 MO		X	1 MO	X						X				11,888	29	2 MO		12-619
57	2ND & POLK TO 7TH & CLAY	30,000	X				NOW																									
58	2ND & POLK TO 7TH & CLAY	30,000	X				NOW		X	X		1 MO		X	1 MO		X	1 MO	X						X				41,561	40	5 MO		12-619
59	2ND & POLK TO 7TH & CLAY	30,651	X				NOW																									
60	24TH & KANSAS TO BUTCHER CREEK	11,545	X				NOW		X	X		1/2 MO		X	1/2 MO		X	1/2 MO		X	1/2 MO					X			6,145	16	2 MO		
61	EDGEWOOD PARK	44,990	X				NOW		X	X		1 MO		X	1/2 MO		X	1/2 MO	X						X				71,064	114	3 MO		
	SEWER LIFT STATIONS																															
62	STORM WATER STATION IN CITY PARK	31,000	X				NOW		X	X		1 1/2 MO		X	NOW		X	1/2 MO	X						X				11,167	27	2 MO		**
63	2 PUMPS FOR CITY PARK STATION	20,000	X				NOW		X	X		1 1/2 MO		X	NOW		X	1/2 MO	X						X				2,000	10	1 MO		**
64	1 PUMP FOR CITY PARK STATION	10,000	X				NOW		X	X		1 1/2 MO		X	NOW		X	1/2 MO	X						X				2,000	10	1 MO		**
65	W.S.INTERCEPTING SEWER & PUMP STA	30,000	X				NOW		X	X		2 MO		X	1 MO		X	1/2 MO		X	1/2 MO					4			11,560	19	3 MO		13-1018a
	DISPOSAL PLANT CONSTRUCTION																															
66	EAST SIDE PLANT IMPROVEMENTS	42,000	X				NOW		X		X	6 MO	X		2 MO	X				X	4 MO						X		12,880	21	3 MO		13-108
	PARK DEPARTMENT																															
67	MAINTENANCE BLDG IN GAGE PARK	24,960	X				4 MO		X	X		1 MO	X			X			X						X			13,000	20	3 MO		13-2512
68	CARETAKER'S RESIDENCE GAGE PARK	3,250	X				4 MO		X	X		1 MO	X			X			X					X				1,000	4	1 MO		13-2512
69	LANDSCAPE SERVICE AREA, GAGE PARK	5,650	X				4 MO		X	X		NOW	X			X			X				X					2,000	5	2 MO		13-2512
70	ZOO BUILDING, GAGE PARK	57,980	X				4 MO		X		X	2 MO	X			X			X							X		16,000	20	4 MO		13-2512
71	CARETAKER'S RESIDENCE, RIPLEY PARK	3,590	X				4 MO		X	X		1 MO	X			X			X					X				1,000	4	1 MO		13-2512
72	PARK LANDSCAPING, CITY WIDE	20,850	X				4 TO		X		X	1 MO	X			X			X					X				6,000	10	4 MO		13-2512
73	CONSERVATORY, GAGE PARK GREENHOUSE	10,000	X				4 MO		X	X		NOW	X			X			X				X					5,000	10	1 MO		13-2512
74	ROADS, GRAVEL	20,000	X				1 MO		X	X		NOW	X			X			X				X					15,000	15	6 MO		13-2512
75	BATH HOUSE	20,000	X				4 MO		X		X	2 MO	X			X			X							X		18,000	15	3 MO		13-2512
76	SWIMMING POOL	10,000	X				3 TO		X	X		1 MO	X			X			X						X			4,000	16	2 MO		13-2521

Engineered to Keep Contractors' Vital Equipment on the Job *All Winter*



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a district in which 90 per cent of the taxes are paid up.

As I outlined at the recent Public Works Congress, the Topeka Plan is the result of earlier planning done several years ago, together with a careful study of present needs, and future needed improvements. Some of the projects we have listed may not be undertaken, will not be undertaken if normal times prevail after the war, for possibly as long as ten years hence. Yet, if the need becomes great enough we shall not be at a loss to know what we should next undertake, our reservoir of projects is full at this hour.

And by that I mean this plan is not just a "list of projects." Some of these projects which are most necessary and would be undertaken if we could, now, are on the shelf ready for a contract letting. Other plans on this list have been studied. We show the status of each one—how much more field work is required, when plans may be completed, together with a study of the status of the project legally speaking, with emphasis showing whether the work must be instituted by petition of interested areas, or by act of the governing body; whether or not a bond election is required to finance the project; or if the authority to finance the project already is vested in the governing body.

These are matters that must be foreseen in any workable plan for post-war projects in our state, and local laws doubtless govern similarly in other states.

After setting up the legal, financial, and time consuming elements of our program, we then proceeded to show what the position of the project is with respect to other elements that may enter into its consideration, should a hastily made work program again confront us, and, to this end we show the matter of right-of-way for the project, is it ready now, or must it be acquired, and how. Next we have broken the projects down into a summation of the total time required for placing the plan under construction considering all phases of its position.

Following this an analysis has been made of the man-hours each project will consume together with an estimate of the number of men that may be placed on the project effectively as a well-planned job, and the total time such a number of men may be used on the project.

Finally, you will notice one column is left blank, that is a "military secret" of the governing body. This is the order in which the projects will be undertaken. This has been done to avoid the influence of pressure groups who naturally will be interested in a particular project as being in their mind a matter of first importance. Such a tabulation as we have prepared at Topeka opens to the public, and especially to other subdivisions of our government in our midst, a program not only of actual projects but of how they may be accomplished, and a financial plan which may not be exceeded by all the agencies interested.

We all know of the mistakes brought about in the past in the administration of public works projects in which Federal aid in some form was available. Some public treasuries are in difficulty at this hour because of unwise project planning. We at Topeka have avoided such difficulties in the past and have charted our course for the future should the need arise. Our program of some 76 projects costing around three million dollars is ready to be used at once if needed, and expanded as fast as the public economy requires. We believe it represents a type of reservoir of works projects which will conserve finances, prevent leaf raking and avoid makeshift construction.

Stockpile Preparation

The recommendation of the Calcium Chloride Association for the preparation of stockpiles of abrasives mixed with calcium chloride follows:

Abrasives—Coarse sand or cinders screened to maximum sizes of ¼ to ½ ins. are recommended by most highway departments. Fine sands are reported to be much less effective. Prepare quantities sufficient to provide supplies for use throughout winter.

Moisture—Sand or chips require 3 to 5 per cent or 12 gals. of water to the cu. yd., cinders as much as 20% moisture.

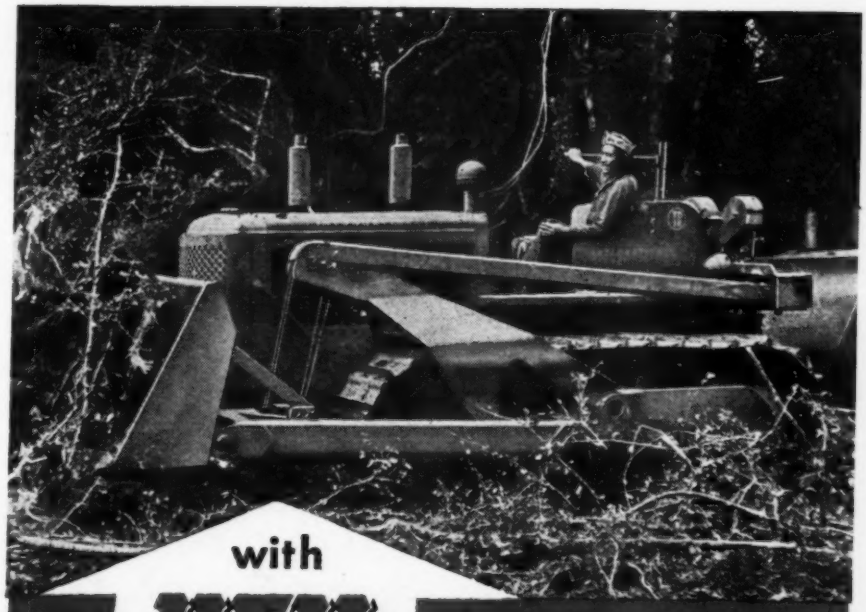
Treatment—Tests show abrasives treated with calcium chloride give skidproofing equivalent to three times as much as untreated grits. Flake calcium chloride, 50 to 100 lb. per cu. yd. of abrasives, is added at time of the screening or stockpiling operation, and distributed as uniformly as possible. If treated abrasives are placed in exposed stockpiles, extra calcium chloride is spread over surface to provide greater anti-freeze protection for exposed portion of the pile. Just before spreading when ice comes, an additional treatment of 25 to 50 lb. of calcium chloride insures immediate embedment in icy surfaces.

Location—Many highway organizations store a substantial quantity in or near central garages and some also have large gravity loading bins. Most common practice is to provide stockpiles at intervals of approximately five miles, to avoid long hauls and backtracking of trucks. Long and low stockpiles, rather than high round piles, are easier to work. Drums or small bins of treated grits at crossings and on hills have proved highly valuable for self-help.

Protection—Stockpiles should be covered to prevent dilution by rains or snow. One method is to cover the piles with the waterproof calcium chloride bags which can be pegged together. Special paper blankets or a thin coating of tar or asphalt are often used. Most effective protection, of course, is given by sheds and covered storage bins.

▼

5-Year Engineering Course at Cornell—Cornell University will require five years instead of the conventional four years for a bachelors degree in all branches of engineering after the war. Under the 5-year curricula 180 credit hours will be required, of which not less than 125 will be given to scientific and technical courses and not less than 36 to managerial and non-technical courses.



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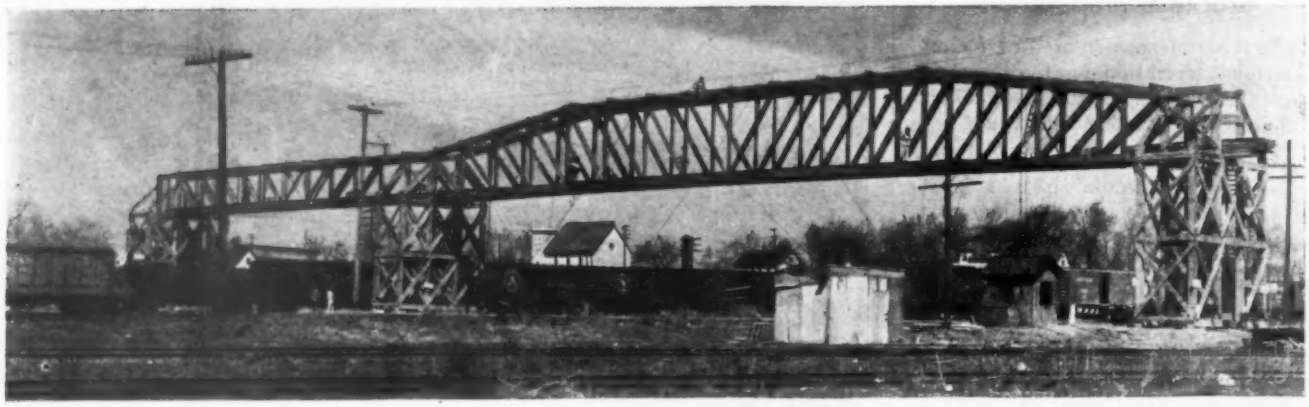


The 95 ft. and 170-ft.-span trusses for this Denver pedestrian overpass were assembled at the site and handled by a single crawler crane

Single 25-ton Crane Erects Large Timber Foot-Bridge

A PEDESTRIAN overpass of unusual timber design was erected recently over 43rd St. in Denver, by Newstrom-Davis Co., contractors for the Colorado state highway department and PRA.

To relieve this condition it was decided to build a pedestrian overpass, and since it was almost impossible to get steel, timber was the only material available to suit the conditions.

The overpass crosses 14 yard and main-line tracks. The spans, of 95 ft. and 170 ft., were chosen to fit the tracks with allowable horizontal clearances. No tracks were moved from their original positions.

The trusses were assembled on the ground. Each truss for the 95-ft. span was assembled completely and each truss of the 170-ft. span was assembled in two sections. The trusses were lifted into place by a 25-ton crane. A temporary bent was used to support one end of sections of 170-ft. span. All joints were made with ring connectors and ¾-in. bolts.

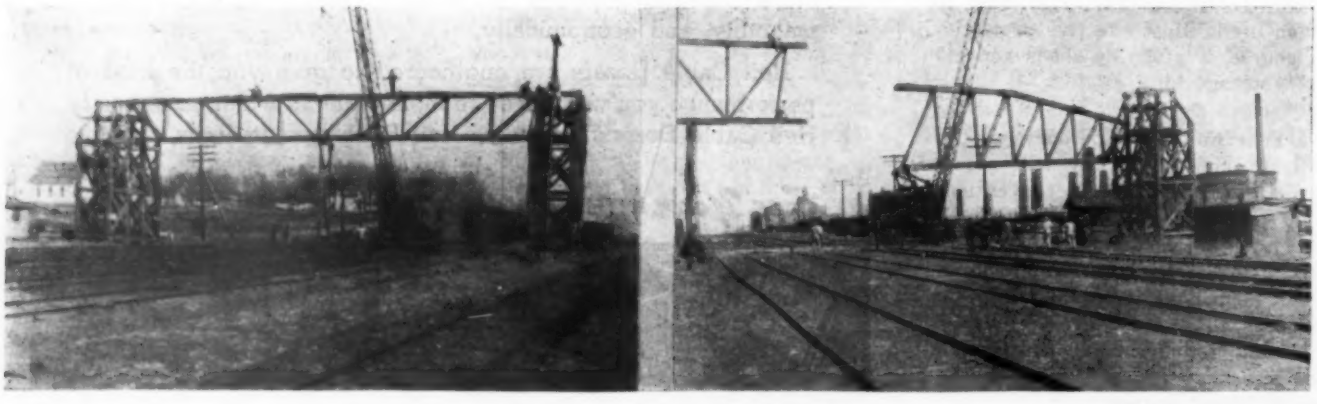
Trusses were designed for a live load of 50 lb. per sq. ft. and a wind load of 30 lb. The 95-ft. truss was cambered four inches and the 175-ft. trusses twelve inches.

The 6-ft. walk and stairway landings are of 2x4-in. laminated construction. The walk is surfaced with ½ in. of "Unicrete." Chain link fencing is placed on both sides of walk and stairways.

The supporting towers, which are high enough to give a minimum clearance above base of rail of 23½ft., are built of 12x12-in. posts. There are eight posts to each tower spaced 7'-4" c.c. parallel to the railroad tracks and 8'-0" c.c., laterally supported on concrete pedestals. Posts are cross-braced with 3x12's longitudinally and 3x8's laterally. Bracing is connected to posts with ¾-in. bolts and 4-in. split-ring connectors.

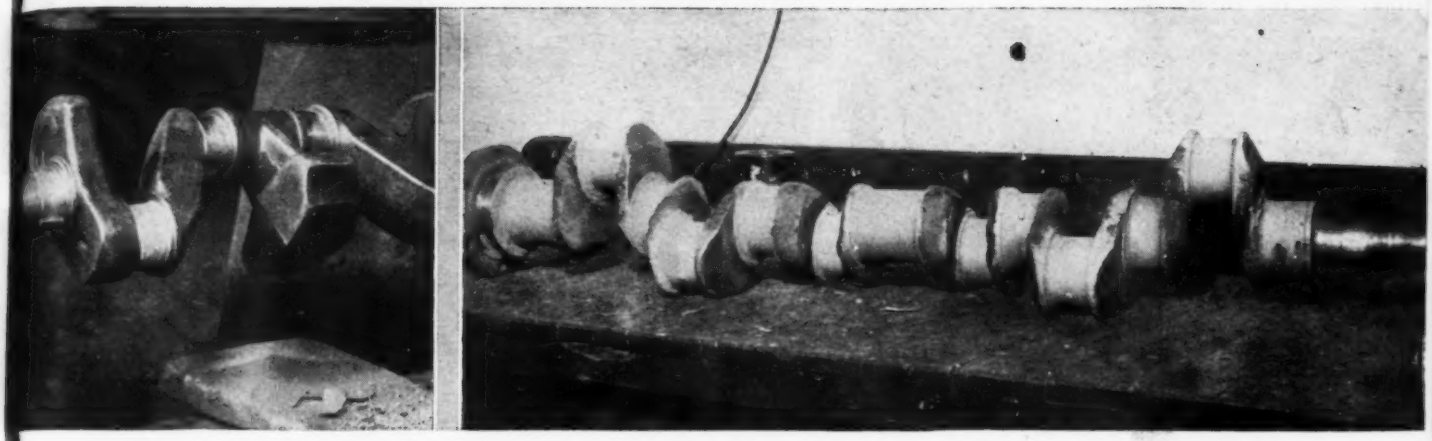
All timber was prefabricated and fireproof treated after fabrication. This structure was built with federal and railroad funds. The city of Denver also cooperated in furnishing right-of-way and lighting. O. K. Peck, engineer of structures for the D. & R. G. W. R. R., was the designer. Weyerhaeuser Sales Co. of Tacoma, Wash., the fabricator.

The longer of the two trusses was cambered 12 inches



Scenes during erection of the two spans

Equipment Maintenance



(Left) Bearing nearest to camera has been grooved or keyed preparatory to spraying on metal. (Right) Metallizing completed

How Shafts and Pistons Are Salvaged with Metallizing

Several hundred units built up without a failure in California highway shop by following these simple rules

ONE of the busiest pieces of equipment these days in the big headquarters shop of the California state division of highways at Sacramento is its metallizing outfit. According to state equipment engineer R. H. Stalnaker, over 200 engine crankshafts have been built up by the metal spray method, and 50 or more pistons for heavy tractors—only part of a year's grist for the spraying units purchased in 1943. Not one part has failed, and some of the pistons are still going strong after more than a year of service.

Sixty-four shafts were treated in the period from June to October, 1944. Only straight shafts, crankshafts and pistons have been handled thus far, the usefulness of the unit on flat surfaces being limited by lack of a sand blasting outfit.

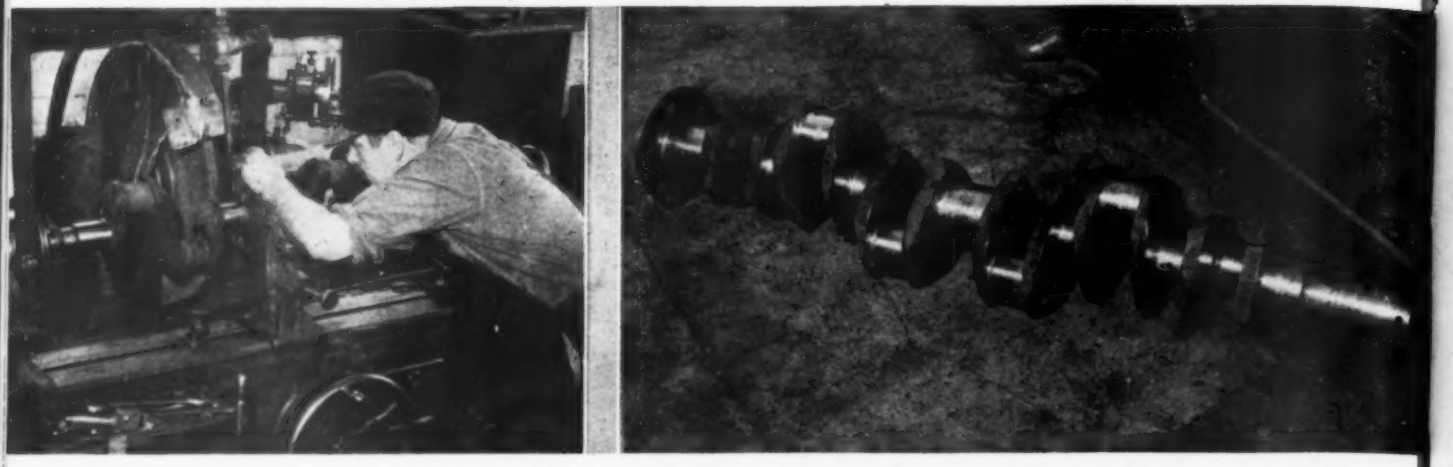
The metallizing is done by one man, who was trained to his special job. The procedure on a shaft or crankshaft is as follows:

1. The shaft is put in a lathe and the worn bearing cut into with a tool which leaves grooves or threads, usually spaced 16 to the inch. Accuracy is not so important at this stage, yet care is taken not to get the threads off diameter.

2. A knurling tool is held against the threads during several turns of the shaft to flatten the edges of the threads and thus "key" the surface so that it will anchor or bond with the sprayed metal.

3. After plugging oil holes, the threaded bearing surfaces are then built up with the gun. Enough thickness is applied so that there will be a minimum of .05 in. of metal on the diameter (.025 in. minimum thick-

Metallizing truck crank shaft in the California state highway shop at Sacramento



Showing machining operation and a finished shaft. A minimum of .05 in. of metal on a diameter is specified, but this depth exceeded as little as possible

ness of metal). Although as much as 30 or 40 thousandths thickness after machining is considered O. K., it is important not to build up the metal too much. A heavier shell is likely to become loose, according to experience.

4. The completely metallized shaft is taken to a very accurate precision grinder and the bearings machined down. Bearings are restored to original diameter whenever possible.

The cost of salvaging shafts is reported to be as low as $35 each.

Pistons are handled in the same manner except that circumferential threads are cut 14 to the inch and the pistons finished undersize. Liners are sometimes salvaged by metallizing and building up to oversize to fit. A batch of tractor pistons were the first parts metallized as a tryout during the summer of 1943, and the shop crew is particularly proud of the durable job done on these and subsequent pistons.

An older lathe is used in turning the parts during metallizing. Since the sprayed metal tends to damage lathe equipment, use of a first-class precision lathe isn't considered advisable, according to Mr. Stalnaker. This method of salvage is particularly valuable today on shafts and other alloy parts that you wouldn't want to try to weld and that must be restored to standard bearing size. Of course, manufacturer's rules should be followed with care in all metallizing work.

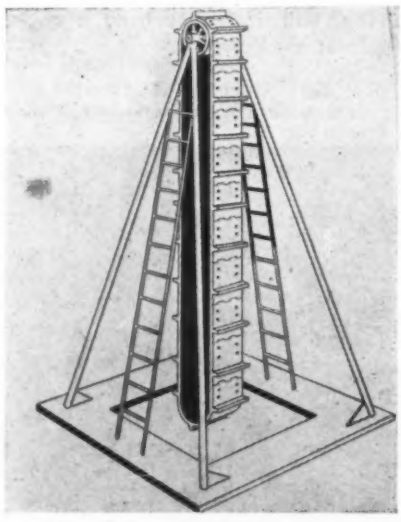
Admittedly, a good many of the jobs so salvaged are economical only in preventing tie-ups where new parts are unobtainable today or obtainable after long delay, but it is expected that the method will have considerable usefulness after the war as a companion to salvage welding.

Stand For Welding Bars on Worn Grousers

(As reported by Conrad D. Kranz in Hobart Arc Welding News)

THE Oliver Iron Mining Company of Virginia, Minnesota, has 15 tractors to keep going and this stand for welding applicator bars on the worn grousers has paid for itself many times in the handling of the tracks during welding.

It takes only a few minutes to put the track up and take it down with the use of a crane, there being only four bolts to take off and put on. With this all-welded stand, it is very easy to turn the sprocket and get the grousers in the most convenient position to weld.



Stand constructed of the following materials: Base, 6-ft. by 1-ft. by 1-in. plate; uprights, 4-in. pipe, 12-ft. long; ladders, ¾-in. rod; braces for uprights, 14-in. by 18-in. by 18-in. by 12-in.

We constructed this stand from all scrap material picked up around the shop and its total cost including electrodes and power was only $22.25 and was completed in two and one-half days' time.

The applicator bars that we use are manganese, averaging 12 ft. in length. It requires three bars to completely repair a worn track. First, cutting the bars to length, we tack weld them on and then weld on the first bead with 5/32-in. stainless steel rod. On the second bead we use 3/16-in. or ¼-in. stainless. We have never had one of these bars break off when welded in this manner.

Motor Vehicle Taxes Decrease $453,000,000

Taxes paid in 1943 in connection with motor vehicle ownership and operation totaled $1,977,036,000 as compared with $2,430,093,000 in 1942, according to National Highway Users Conference compilations based on tables released by the Public Roads Administration and other sources of information. Decreased tax returns reflect restricted motor vehicle use and declining registrations. Total private and commercial motor vehicle registrations dropped from 34,163,391 in 1942 to 31,887,142 in 1943. Motor vehicles owned by Federal state and local governments numbered 409,740.

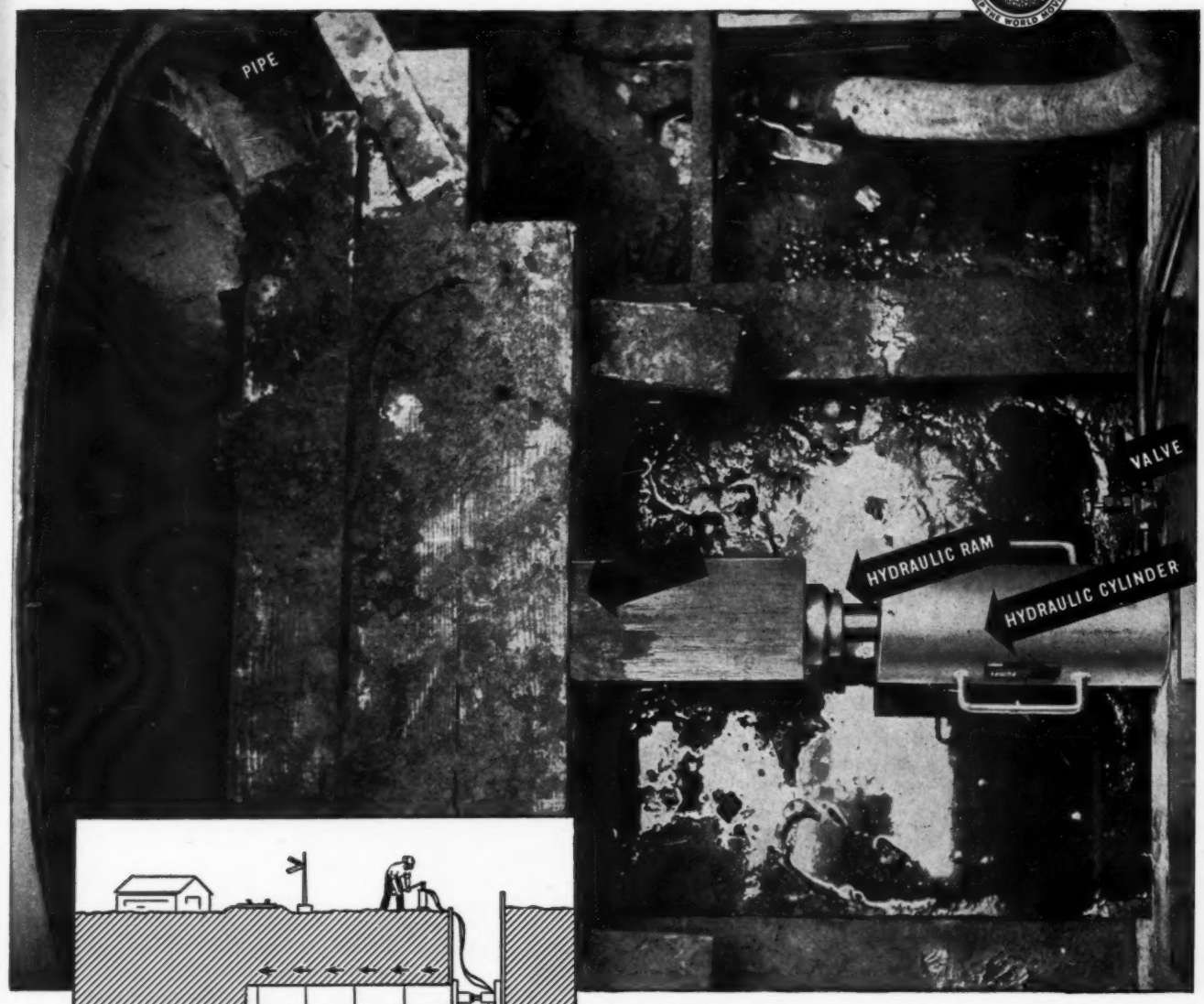
TRANSITS and LEVELS
HEADQUARTERS FOR REPAIRS— —any make—

We will buy or trade in old Transits, Levels, Alidades, etc. Send instruments for valuation.

Write for new Catalogue RS-911 of Engineering Instruments, Engineering Field Equipment and Drafting Room Supplies.

WARREN-KNIGHT CO.
Mfgrs. of Stadia Transits & Levels
136 N. 12th St. • Philadelphia, Pa.

NO. 21 OF A "READY-WITH-A-RODGERS" SERIES



Shaft viewed from above

"DRIVING PIPE FOR THIS STORM SEWER WAS DUCK SOUP WITH OUR RODGERS UNIVERSAL"

"We had to go under a freight house and railroad tracks, pushing 6-foot concrete tile through sand for 40 feet. But our Rodgers Universal Press handled it slick as a whistle . . . at 1/10 of what it would have cost without your equipment.

"Headed by a steel bonnet, the tile was inched through without a hitch. And it was a big help to pump that 150-ton pressure from the surface, instead of a cramped space 16 feet underground."

This was reported by a Wisconsin municipality. The all-purpose Rodgers Universal Press saved them both time and money. It can do the same for you. For complete information and prices, write or wire Rodgers Hydraulic, Inc., Dept. C-11, St. Louis Park, Minneapolis 16, Minnesota.

If it's a Rodgers it's the Best in Hydraulics

Uses for the RODGERS UNIVERSAL HYDRAULIC PRESS
Gear Pulling • Wheel Press Work • Jacking Pipe • Erecting Machinery • Relocating Machinery • All-Purpose Jack

RODGERS HYDRAULIC, Inc.

How to Prevent Roadside Flat Tires

. . . Your staff can catch flats before they occur through the "comparative air loss system"

ACCORDING to a pamphlet issued by Office of Defense Transportation, Washington, D. C., surveys and careful tests have revealed a situation which is responsible every day for needless destruction and premature wear of millions of tires and tubes. A new simple method, known as the Comparative Air Loss System, which requires only seconds of time and no special equipment, reduces this waste. It is worth careful study by every fleet operator and staff.

This simple Comparative Air Loss System (described below) will give advance indications of punctures or air leaks which shorten tire life and lead to "roadside flats." The system is based on the following tire facts.

All tubes lose air naturally—a constant small loss due to the natural characteristics of rubber tubes.

Most punctured tubes do not go flat for days or even for weeks. In experimental tests in which nails were driven into 135 passenger tires and tubes of standard design, only five abnormal air losses developed within the first day.

In a typical experiment a four-penny nail was driven into each of four tires and tubes on the same vehicle. Three went flat at 2,300, 3,900 and 5,100 miles, respectively, and one stood the full 8,480 miles of the test.

Tires do not go flat until the final "break." The elasticity of the rubber will nearly seal the hole around a nail. Only a small amount of air will be lost until "fatigue" breaks down the rubber at the edge of the hole and permits an excessive loss of air.

Ninety per cent of all flats can be prevented by using the Comparative Air Loss System. The System indicates punctures *before* flats occur, and eliminates the possibility of a tire valve as the source of leakage simply by keeping the valve cap in place and finger-tight at all times.

A valve cap, which has its rubber, air-sealing washer in place, is screwed on tight, will absolutely *prevent any loss of air at the valve.* Therefore, if the valve cap is on tight and excessive air loss does occur, you are immediately warned of the existence of a puncture in that tire.

Actual records prove the results of this two-point method. A bus line with 139 buses in daily use reduced their roadside tire changes to an average of one per 212,000 vehicle-miles. Another line, 494,000 vehicle-miles.

How to Check Your Tires by the Comparative Air Loss System

The method requires about 40 seconds of time for passenger cars—and only slightly more for trucks, buses, etc.—just prior to *inflating* the tires. Here's how it's done! (Assuming tires were inflated to specified pressures at previous check.)

1. **Make certain that the valve caps had been screwed on finger-tight and that each cap had an air-sealing, rubber washer.** Otherwise low pressure might have been caused by a leaky valve.

2. **Before adding air, test and record the pressure in each tire** (See sample record card). Test the air pressure of each tire **when all the tires are cool.** This is necessary because the air in a tire increases in pressure as a tire is heated and the temperature of a tire depends upon the load on the tire. Since all tires on a vehicle may not be heated to the same degree, gauge pressures of hot tires may be misleading insofar as the Comparative Air Loss Test is concerned.

3. **How to detect punctures.** Check the variations in tire pressures. Slight differences in pressure will always be found, but the following differences, if valve caps had been on tight, indicate the existence of punctures:

Any passenger car tire 3 lb. or any truck tire 5 lb. below the lowest of its running mates can be suspected of having a puncture (See sample report), and should be removed for examination and repair.

4. **Add air to bring each tire to its specified air pressure.**

5. **Screw on valve caps finger-tight.** Make sure the rubber washer is not damaged or missing.

When foreign objects are removed from a tire tread, **a vehicle should not be operated until the Comparative Air Loss Test has been made.** It is recommended that several hours' time be allowed from the time of removal until the comparative test. If an object has pierced the inner tube, its removal results in pulling the plug out of the hole, thereby changing a slow leak to a fast leak.

VEHICLE No.

TRUCK AND BUS

Comparative Air Loss System

TIRE PRESSURE RECORD

DATE CHECKED	FRONT		1st REAR AXLE				2nd REAR AXLE				SPARE
			RIGHT REAR		LEFT REAR		RIGHT REAR		LEFT REAR		
	RIGHT FRONT	LEFT FRONT	OUT SIDE	IN SIDE	OUT SIDE	IN SIDE	OUT SIDE	IN SIDE	OUT SIDE	IN SIDE	
3/21/44	68	70	69	66	(61)	67	70	68	66	69	

Note the variation of four pounds between all tires except one (circled) which is five pounds below the lowest of the others. This immediately warns of trouble in that tire

▼

AGC Meeting to Study Postwar Problems

The fall meeting of the Governing and Advisory Boards of the Associated General Contractors of America, to be held in the Drake Hotel, Chicago, Ill., on Nov. 28 and 29, will be devoted primarily to a general coverage of probable developments affecting the construction industry in the reconversion and postwar periods. Particular emphasis will be placed on the necessity for getting construction programs underway during the transition from war to normal peacetime conditions.

The Lincoln Arc Welding Foundation should have been credited in publishing the article by Clinton Stutter in last month's ROADS AND STREETS entitled, "Wheel Carriers Salvaged With Jig." This article was a slightly condensed version of a prize winning paper on the subject, based on the author's welding experience in the Central Motor Shop, Dept. of Sanitation, New York City.

"GULF QUALITY PRODUCTS

AND FINE SERVICE HELP US GET MORE WORK-HOURS FROM OUR EQUIPMENT"

*says this Contractor**

*Austin Road Co., Dallas, Texas, is adding two additional lanes to 8-1/3 miles of highway No. 81 between Fort Worth and a key airport north of this city. Gulf quality lubricants and fuels are helping the contractor get top performance from the many units of equipment employed on this job.

"Proper lubrication with Gulf quality oils and greases helps keep all our equipment in good condition—and Gulf's prompt delivery of lubricants and fuels contributes to fewer delays in servicing it," says this Texas road contractor.* "We're satisfied that we get more work-hours from every unit and lower maintenance costs with Gulf products."

On all types of wartime construction jobs, Gulf quality petroleum products are playing an important part in keeping equipment rolling under tough schedules and punishing operating conditions. Gulf lubricants provide greater protection against breakdowns and mechanical troubles—and Gulf motor fuels help contractors get more efficient performance from their equipment.

Write, wire, or phone your nearest Gulf office now and arrange to use Gulf higher quality lubricants and fuels on your next job. They are quickly available to you from twelve hundred warehouses located throughout thirty states from Maine to New Mexico.

GULF

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FOR BETTER LUBRICATION, LONGER

The oil lasts longer—and so does the engine. Here's the reason. The exclusive WGB cartridge removes from oil not most, but *all*, the enemies of engine-life—dirt, sludge, water, harmful acids, colloidal carbon. It is easily installed by hand, without tools, and replacements cost less than oil changes. Heavy-duty WGB Clarofiers, for all gas and Diesel engines, are rugged, simple in design and operation, and each model is specifically designed for the job it has to do. Bank on the proved reputation of WGB oil clarofying. It saves time, money, overhauls, oil, and irreplaceable engine parts.

Free book describing low-cost WGB oil clarofying—for gas and Diesel engines—is yours for the asking.

WGB
OIL CLARIFIER, INC.
KINGSTON, N. Y.

LET'S KEEP SEDIMENT OUT OF LUBRICATION

Advice to Green Truck Drivers on
Driving in the Rough

A COMMON sight that brings anguish these days is to see good trucks badly handled by green or hell-if-I-care drivers. A good truck driver isn't "born." He's shown and told right practice and one of the best training aids in print is the *Driver's Manual* put out by the White Motor Company, Cleveland, Ohio.

Following is a brief chapter on fundamentals of off-the-road driving:

Soft Going — Deep sand, mud, boggy ground and very rough terrain should be avoided whenever possible.

If the truck does get stuck in deep ground, the clutch should be immediately released if the wheels begin to spin. Allowing the wheels to spin will permit them to dig in deeper.

"Frogging" the truck is not advised. This practice is likely to cause breakage of any of the drive parts of the truck.

Careful rocking back and forth is a method that may be successfully used in some cases to get out of a hole.

Towing by another vehicle on firmer ground is recommended. In hooking into either vehicle for towing, the point of attachment should be the truck frame, or a towing hook on the frame.

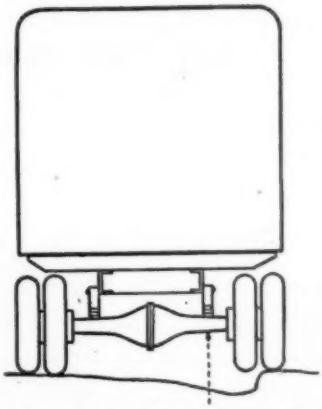
Rough Going—The driver should bear in mind that whenever the load is carried on the outer tire only of a dual wheel—that is, when the outer tire is riding on a bump or a ridge so that the inner tire is not carrying a load, the bending stress on the axle housing and also the load on the wheel bearings are at least 50% greater than when the load is carried evenly on the two tires.

Impact loads caused by trying to make speed over rough ground will also cause high strain in the truck chassis parts.

Loading and Unloading—In off-the-road operations, loading is usually accomplished by shovel, crane or skids. In each case, extreme overloading of the rear axle, springs and frame may occur unless the operator understands and takes the necessary precautions.

Probably one of the worst of all possible dangers for the rear axle exists during shovel loading of dump units. Careless operators will sometimes drop the equivalent of practically a full load, for the vehicle, into the body from a height of several feet. The impact loads thus imposed are frequently responsible for housing failures.

Keeping the axle properly tightened up, in respect to radius rods, spring U-bolts and center housing bolts or stud nuts is one of the primary precautions. Regular inspection of the springs is necessary, so that they will not sag, due to broken leaves, thus allowing the frame of the truck to hit the axle housing. If the rear springs are strong enough and have sufficient clearance, they will reduce the overloading of the axle from shocks.



Load on axle housing at point indicated by arrow increases more than 50% above normal due to outer dual carrying all the load when riding a ridge or a curb

The housing should be inspected at regular intervals for cracks or permanent deflections and especially after any severe overloading or unusual abuse.

Permanent deflection of the housing and springing of the housing under overloading conditions cause misalignment of the gears and shafts within the axle. Such misalignment, of course, results in very early failure of the gears and bearings.

Four Shop Suggestions from Overhaul Work in Colorado

By F. E. CUMMINGS
Ass't. Superintendent of Maintenance, Colorado State Highway Department, Denver

When overhauling a truck it is the practice of the Colorado State Highway Department to disassemble throughout, wash all parts clean and inspect for worn parts and bearings. This procedure is followed on all equipment overhauled in the state highway shops.

Catching Broken Bearings. Repair parts are hard to obtain, and by using this method of close inspection we have saved many gears from being damaged by broken bearings dropping into the gears. Many times we find bearings that are worn out or broken but haven't reached the point of falling apart. If these bearings had not been found during the overhaul they would most likely have ruined some of the gears within a few days after the machine was put back in service.

In some cases bearings went out before the equipment was brought in for overhaul, and some of the bearings went through the gears and have broken only a tooth or two off the gears. Often here we have welded teeth back in or built new teeth with the electric welder, then ground them down to the right pitch.

Valve Insert Rings. Motor valves are taken out. In cases where they have been ground previously until the seats are cut down into the motor to such an extent that they are below the motor surface, we put in valve insert rings, build up the valves with a hard-surface electrode, then resurface and grind them in. In doing this we have kept several motors in service where otherwise the motor would have been laid up for days or weeks waiting for new valves.

Connecting Rod Bearings. We have had a lot of trouble with crankshaft and connecting rod bearings pounding out as the amount of tin was reduced into the bearing babbitt. Also our equipment is getting old and the con rods are getting out of round and more or less weak, so we have been welding bronze into the rod and caps, then using a jig we made in the shop that is fitted on the lathes. We bore out these con rods to a perfect circle and .013 larger than the diameter of the crankshaft, then tin the bronze and pour a babbitt bearing and machine it out to the proper clearance for the shaft. In doing this we find that the bronze makes the rod and cap more rigid and the babbitt does not flake out so easily. We have had very good luck with these bearings.

Emergency Chip Spreaders. Not being able to obtain sufficient chip spreader boxes for sanding icy surfaces on our roads we have taken old obsolete truck bodies and cut them apart and built spreader boxes in our State Highway Shops. For wheels we used wheels off an old multiple maintainer. The wheels had a 6-in. solid rubber tire and were 24 in. high and could not be used "as is." We cut the spokes off, removed the tire, then we bought a piece of 16-in. diameter well casing 16 in. long, placed the hub inside of the casing and welded the spoke to the casings. This made a wheel of 16-in. diameter with a 16-in. tire. For the chip spreading drum in bottom of box we took a 6-in. well casing and welded a ¼-in. spiral bead around the casing, leaving a 3-in. space between the beads. We also made the jaw clutches in the state shops.

RBC
NEEDLE BEARING
Offer
ECONOMY
From Every Point of View

CLUES to better Bearing Performance
HIGH LOAD CAPACITY
LIGHT WEIGHT
SMALL SIZE
UNIT CONSTRUCTION
ECONOMY
WEAR RESISTANCE
CORRECT ALIGNMENT
ALL TYPES — Full Range of Sizes
PRECISION
High Carbon Alloy Bearing Steel
ELIMINATION OF FRICTION SILENCE

ECONOMY OF SPACE
Minimum overall dimensions of the R B C CYCLOPS Needle Bearing pictured here, and the 20th CENTURY Needle Bearing as well, results in smaller housings thereby saving metal and streamlining machine tools and modern portable and stationary equipment of all types.

Capacity / Space = Maximum for Needle Bearings

GREATER CAPACITY PER DOLLAR
The large-capacity, small-size ratio of these outstanding bearings enables the engineer and designer to select smaller dimension bearings that in most cases still provide double the load-carrying capacity of the better roller bearing of five years ago. This is economy in the truest sense.

Capacity / Cost = Maximum for Needle Bearings

ECONOMY OF MAINTENANCE
Use of R B C Needle Bearings means practically no maintenance cost. Their ability to function efficiently under severe operating conditions eliminates shutdown of equipment. Management demands continuous production and Plant Engineers will praise Engineers and Designers who specify trouble-free R B C Needle Bearings in their equipment.

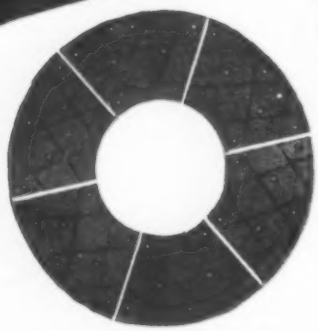
Service / Maintenance Cost = Maximum for Needle Bearings

R B C's ENGINEERING STAFF WILL HELP YOU IN SELECTING THE RIGHT BEARING, AND IN FOLLOWING OUT THE CORRECT BEARING PROCEDURE. LET US KNOW YOUR PROBLEMS.

ROLLER BEARING CO. OF AMERICA
TRENTON, NEW JERSEY

THIS IS PROGRESS

Peacetime pioneering of advanced brake lining and clutch facings by Raybestos kept pace with the most exacting friction requirements. But under the "forced draught" of war's gruelling demands, Raybestos developments in products and production methods have been revolutionary. An example is the remarkable Raybestos "1492" bomber brake block. ★ The war-won know-how, plus peacetime leadership, makes Raybestos the most complete line of finest quality friction materials available—friction materials specially engineered for every make, model and job, and accepted by consumers everywhere. ★ Today and tomorrow it will pay you, too, to specify Raybestos.



Ray-Metl Master Clutch Facing for Tractors. A composition of asbestos and fine metallic powder.

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INVEST IN AMERICA
BUY BONDS

Raybestos
AMERICA'S BIGGEST SELLING
BRAKE LINING

BRAKE LININGS, CLUTCH FACINGS, FAN BELTS, HOSE FOR CARS, TRUCKS, BUSES, TRACTORS ON THE WAR AND CIVILIAN FRONTS

100 Years of Contracting

THERE are few business enterprises in the country that have had 100 years of continuous existence under the same ownership. In that most hazardous of all business — contracting — the companies that have been in operation for a century could probably be numbered on the fingers of an old time freight train brakeman's hand. So it is of much interest to note that the company, C. W. Blakeslee & Sons, New Haven, Conn., is now celebrating its 100th anniversary.

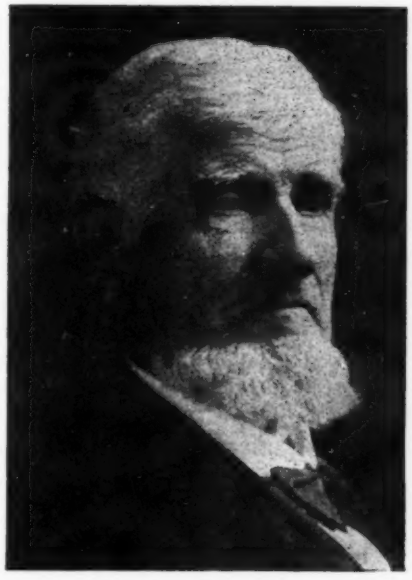
This firm was founded in 1844 by Charles Wells Blakeslee, then 19 years of age. Later three of his sons, Dennis A., Dwight W., and Clarence Blakeslee, became associated with him in the contracting business. Dennis joined his father in 1872 forming a partnership under the name of C. W. Blakeslee & Son.

In 1890 when Dwight W. became a partner the firm name was changed to C. W. Blakeslee & Sons continuing under this name until 1929 when the firm was incorporated.

In 1895 Clarence joined his father and brothers after having had ten years' experience in railroad work following his graduation from Yale Sheffield Scientific School in 1885. At the time of his departure from the New Haven R.R. he held the position of division engineer.

Later grandsons of the founder were employed and until the present war various members of the fourth generation have been working either full or part time. Recently one of the foremen stated, "When I work for Dick's boy" (who is now nine years old) "I will have worked for five generations."

Dennis A. Blakeslee



Charles W. Blakeslee

The officers of the corporation are, Clarence Blakeslee, Chairman of the Board; M. Grant Blakeslee, President; William T. Gilbert, Vice-President; Albert D. Blakeslee, Secretary; Harold L. Blakeslee, Treasurer; F. J. Schwichtenberg, Assistant Secretary and Assistant Treasurer.

Wide Variety of Work Handled

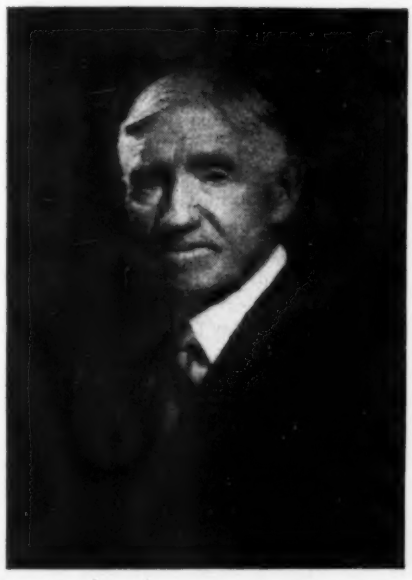
This company since its inception has been engaged in a general contracting business mostly throughout Southern New England and east of the Hudson River, although at times contracts have been executed in Pennsylvania and as far west as Indiana. The scope of work performed during the 100-year period has been wide and varied, including among other things the construction of railroads, bridges, dams, foundations, highways, conduits, sewers, docks, tunnels, dredging and quarrying operations. During the early years a $50,000 contract would have been considered a large venture but by steady growth and development the size of jobs the company is capable and equipped to handle runs well into the millions.

Contracts Include 36-Mile Concrete Road in 1920

Some of the larger contracts are the Stevenson Dam on the Housatonic River, built for the Connecticut Light & Power Co. from 1917 to 1920, 4-mile cut and cover and tunnel section of the Catskill Aqueduct of the New York Water supply system constructed in 1909 to 1912, the development of the North Branford water supply for the New Haven Water Co. which included besides the main dam several auxiliary dams and over four miles of tunnels and six miles of 36-in. pipe line covering the period from 1925 to 1930, 35-mile section of concrete highway between Hartford and New London constructed in 1920 to 1922, when jobs of that size were unheard of in New England, and a large number of the New Haven Water Co. dams have been either originally built or repaired by this firm. The three dams and distribution system of The Seymour Water Co., Seymour, Conn., were Blakeslee constructed as well as most of the bridges in the City of New Haven during the past 30 years. Also, the East Street Sewage Disposal plant, New Haven, and a great number of the New Haven city streets paved with bituminous macadam, asphalt or concrete. Excavation for and preparation of foundations for the Yale buildings constructed during the period sometimes called "the period of construction of the new Yale" were done by this company. Foundations for and bulkheads, etc., at the United Illuminating Co.'s English Station, New Haven and Steel Point Station, Bridgeport, were built by Blakeslee.

Has Weathered Four Depressions

The management of the firm has always been of a conservative nature so that the depression of 1874 followed by the 1907 and 1920 slumps



Clarence Blakeslee

and then the master depression of 1929 have all been successfully resisted, this conservatism having kept the business on an even keel during depression as well as boom times. The management has been built up and maintained by a spirit of good will and fair treatment between employer, employee, and customer. The employees are loyal to the firm and take real satisfaction in making quality their goal in workmanship. Such ideals have fostered and strengthened the friendship of the public with whom the firm is in daily contact.

At one time C. W. Blakeslee and Sons used 225 horses in their various activities, some of these horses not getting back to the home barn for 3 to 5 and 6-year periods. These horses are now replaced by a fleet of 65 motor trucks.

In 1930 the field of ready mixed concrete was entered with the erection of a central mixing plant. Reliability and accuracy of the operation of the plant are secured by modern scales automatically controlled by an electric eye. New Haven and vicinity is serviced by special bodied trucks. The first stone crusher in the country was made by the Blake Foundry in Westville in 1873 having been patented in 1858. C. W. Blakeslee & Son hauled stone from the quarry at the face of West Rock to the crusher when it was in experimental operation. Daily capacity of the first crusher was 40 tons, today Blakeslee's Pine Rock crushing plant has a daily capacity of 600 tons. It is also of interest to note that the owners of the corporation are also interested in affiliated companies. The Seymour Water Co., Seymour, Conn., was incorporated in 1898 and has been operated and largely held by the members of the Blakeslee family. The New Haven Trap Rock Co. was incorporated in 1914 for the purpose of operating a trap rock crushing plant at North Branford, this plant being the largest plant of its kind in the world. In 1925 the business and holdings of the Connecticut Quarries Co. were acquired and later consolidated with the New Haven Trap Rock Co. under the latter name. In 1917 the Dwight Building Co. was formed under the leadership of Dennis A. and Clarence Blakeslee and named after their deceased brother who was killed in 1906 in the New Haven R.R. cut during the progress of a contract for straightening and widening the railroad right of way through the city of New Haven. This company (The Dwight Building Co.) is one of the larger builders in the New Haven area.

Over 325 Men Continuously on Pay Roll

The organization of C. W. Blakeslee and Sons, Inc., and these affiliated companies carry over 325 men continuously on the weekly payrolls with over 600 being employed during the busy season. The management of the corporation is comprised of a group of men skilled and experienced in their various lines of operation and who are sincere in their efforts to carry on the rich heritage which has come down to them through a period of 100 years of continuous operation.

It might be a matter of interest to note the following tabulation showing the number of years some of the employees have been with the company:

3 men continuously over 45 years
11 men continuously over 35 years
34 men continuously over 25 years
40 men continuously over 20 years
15 men continuously over 15 years

▼

New Bridge Engineer for PRA

Oscar L. Grover, Chief of the Bridge Division of the Public Roads Administration, has reached statutory retirement age and his retirement is announced by the Public Roads Administration of the Federal Works Agency. He has been reappointed as special consultant on bridge and structural problems and will continue to serve the organization in planning post-war construction. His services with the Federal Government began in 1914 and he has been in charge of bridge design throughout the entire period of Federal-aid road construction.

Raymond Archibald, Principal Structural Engineer, has been appointed Chief of the Bridge Division. He has been with the Public Roads Administration since 1935 and was in charge of design and construction of

Raymond Archibald

bridges on the Alaska Highway. This work involved bridging 133 streams, including a number of large rivers and presented many problems not encountered on normal bridge work. Work on five major crossings was carried on through the winter of 1942-43 in temperatures ranging as low as —40°. The Peace River suspension bridge is the most notable structure erected under his direction. He is a native of Albany, Ore., and was graduated in civil engineering at Oregon State College in 1919. Before coming to the Public Roads Administration he was engaged on bridge work for the highway departments of Oregon, Missouri, Arkansas, Maryland and Idaho.

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No More Gas Tax Divisions in Washington—At the election on Nov. 7, voters of the state of Washington approved an amendment to the constitution requiring that all special motor vehicle taxes be spent only for highway purposes. Sixteen states now have approved such an amendment.

Chicago Meeting Takes Shape

Plans are well under way for the 42nd Annual Meeting of the American Road Builders' Association to be held at the Stevens Hotel, Chicago, January 16-19. For the first time since the beginning of the war the program will include technical sessions devoted to improvements in highway design, new construction methods, new materials and wartime developments in construction machinery. Equally important, programs and policies of the federal government in connection with postwar public works, disposition of war surpluses, reconversion, wages and hours and other related subjects will be discussed by those "in the know."

Reservation blanks will be mailed to A.R.B.A. members at an early date. In the meantime, put this note on your calendar:

"A.R.B.A. MEETING, Chicago, January 16-19."

HIGH EARLY STRENGTH WITH BUILT-IN CURING

Insure Your COLD-WEATHER CONCRETING

The simplest and most economical way to get full strength into cold weather concrete is with standard portland cement and calcium chloride in the mix.

Full strength depends upon adequate curing. With calcium chloride, curing is "built-in." Long series of tests over many years have shown that calcium chloride accelerates cement hydration and produces greater strength in concrete at all ages.

Earlier removal of forms and faster finishing are attained with the early strength gained by calcium chloride's "built-in" curing. These advantages are gained with high early or air-entraining cements as well as with standard portland cement. In the air-entraining cements, calcium chloride compensates for the slight losses in strength as compared with the standard normal cements.

Ask for our Bulletin No. 28, "Early Strength Concrete," which explains these facts in detail and shows you how to speed up your winter concreting. Calcium Chloride Association, 4145 Penobscot Bldg., Detroit 26, Michigan.

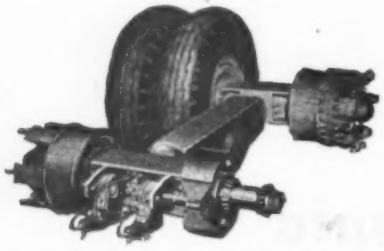
FOR YEAR-'ROUND CONCRETING

USE CALCIUM CHLORIDE IN-THE-MIX

New Equipment and Materials

Hydraulic Brakes for Heavy Duty Trailers

The C. R. Jahn Co., 1341 W. 37th Place, Chicago, Ill., has recently announced that its heavy duty industrial trailers with capacities ranging from 5 to 100 tons are now available with hydraulic brakes. These are the same type of brakes that have proved so efficient and safe on millions of trucks and passenger cars.



Hydraulic Brake for Jahn Trailers

This new application of hydraulic brakes which was developed and thoroughly tested by Jahn engineers is stated to mean smoother, faster braking action with positive, equal brake pressure on all wheels. There's no possibility of partial application or dragging of the brakes when operating over rough terrain. Full motive power can be utilized in pulling the load. Unlimited oscillation of the tandem axles is possible without affecting braking action. With brake rods, pins, and cables eliminated, maintenance is stated to be reduced to the minimum and safety is greatly increased.

▼

New Heavy Duty Hoist Hook

A new safety hoist hook has been placed on the market by the American Chain Ladder Co., Inc., 151 East 50th St., New York City. A single No. 2 hook weighs only 9½ lb. but has a guaranteed capacity of 10 tons and is stated to have withstood without any ill effects a Columbia University Laboratory proof test of 60,000 lb. The advantages claimed for the new hook include: Because it is carefully engineered for the purpose it keeps hoist and load in true alignment, while the patented shoulder and lip eliminates load slippage and hook straightening. Even should the heavy pin shear, the weight of the load would continue to hold on the safety shoulders and lips. These self-locking shoulders and lips, incidentally, were carefully designed to clear hatches, cornices and other protuberances without snagging. The hoist hook was invented by Robert Hoffman, an engineer, who while engaged on such projects as the North Island Navel Base at San Diego, Pan-American Highway, etc., experimented with many types and designs of hoist hooks.

▼

Highway Ditch Cleaner

A self-loading attachment for dump trucks, designed for cleaning ditches along highways, has been put on the market by the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore. The unit is a work attachment for any standard dump truck. Traveling on the shoulder of the road the truck drags the scraper until it is filled, then as the truck backs up the scraper is raised and the contents dumped into the truck. The attachment also is suited for other loading operations when the scraper is replaced with a loading fork.

The Hystevator

▼

1945 International Trucks

The commercial trucks produced in 1945 by International Harvester Co., Chicago, Ill., under governmental authorization will carry the same model designations and be styled the same as Internationals built in 1942 and 1944 for civilians. In keeping with Harvester's traditional policy of constant product improvement through the incorporation of new design features and new materials as soon as they have been proved by exhaustive tests, these new trucks will embody many new features and improvements, some of which had been contemplated before truck production was stopped by the government in March, 1942. Most of these improvements have been incorporated in various military models the company has produced since that time. It is now permissible under material regulations to make use of them in civilian production. These new civilian trucks will be sold through the regular International Harvester dealer and branch organization to operators whose business requirements place them on the ODT priority list. Five basic models will be available in the 1945 International line, according to P. V. Moulder, general manager of the Motor Truck Division. These will be produced in a variety of wheelbase lengths and with equipment to meet the requirements of essential users. Production of the popular medium-duty Model K-5, several thousand of which were built in 1944, will be continued as will the heavy-duty Models K-7 and KR-11. Additions to the line for 1945 will be the light-duty K-3 and the heavy-duty K-8, also basic pre-war models. These trucks have the following gross vehicle weight ratings: K-3, 6,650 pounds; K-5, 13,500 pounds; K-7, 16,500 pounds; K-8, 20,000 pounds; and KR-11, 27,000 pounds.

▼

Portable Electric Hand Searchlight

A portable electric hand searchlight that is stated to project a beam of light more than 2,500 ft., or, by means of a snap-on lens, give the same volume of light over a wide area, has been brought out by U. C. Lite Manu-

"Big Beam" Model 411, Portable Electric Hand Search Light

MORE THAN "LUCK"

Ever since we converted to all-out war production, we've been reminding civilian truck operators, "If you've got a Mack, you're lucky." But it really isn't a matter of just *luck*.

To begin with, nothing is left to luck or chance in their manufacture. Since 1900, we've set out to build the finest trucks in the world, and every Mack we've built since has been engineered and constructed with that idea first in mind. Macks on the road have stood up on their jobs better because they were built to be more truck—not just because they were "lucky."

And finally, the men who operate these Macks didn't buy them on a hunch, but because they knew Mack's worth, and had seen it proved again and again. Just as it is being proved today under the toughest conditions any truck has ever had to face!

Mack

TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

Mack Trucks, Inc., Empire State Building, New York, N. Y. Factories at Allentown, Pa; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

IF YOU'VE GOT A MACK, YOU'RE LUCKY... IF YOU PLAN TO GET ONE, YOU'RE WISE!

facturing Co., Chicago 11, Ill. The light is powered by a heavy-duty shockproof 6-volt storage battery, rechargeable from any A.C. charger, D.C. line or light plant. Recharging is simple, clean and safe and it is not necessary to remove battery from container. Lamp head can be turned in any direction and stays adjusted. Perfectly balanced for carrying, either by hand or with shoulder-strap. Can be set almost anywhere, and by use of a hold-down can be securely anchored to any flat surface.

▼

New ½-Yd. Shovel

Koehring Co., Milwaukee, Wis., has announced a ½ yd. shovel, convertible to crane, dragline or pull shovel. It is also available as a cruiser crane mounted on rubber tires, and can be furnished for truck mounting. Orders are now being accepted on a priority basis for shipment when present military needs are terminated. This post-war model is one of many that Koehring will have available for civil-

Koehring Model 205 Shovel

ian requirements. It is known as Model 205. Many new features have been incorporated for greater speed, increased production capacity, easy operation, low maintenance costs. Outstanding design improvements are: same boom for shovel or pull shovel operation; trigger-fast dipper trip; independent unit traction gear case; easily removable machinery units; instant travel reverse; spacious walk-around; head room in all parts of cab.

▼

Meetings Ahead

American Road Builders Association, annual meeting, Stevens Hotel, Chicago, Ill., week of Jan. 14.

Associated Equipment Distributors, annual meetings, Edgewater Beach Hotel, Chicago, Ill., Jan. 21-24.

National Sand & Gravel Assn., Hotel New Yorker, New York, N. Y., Jan. 23-25.

National Ready Mixed Concrete Assn., Hotel New Yorker, New York, N. Y., Jan. 24-26.

National Crushed Stone Assn., Hotel New Yorker, N. Y., Jan. 29-31.

With the Manufacturers

Le Roi Appoints New Compressor Sales Manager

Le Roi Co., Milwaukee, Wis., manufacturers of portable air compressors, internal combustion engines, and engine-driven generator sets, has announced the appointment and advancement of Norman M. Sedgwick from assistant manager of compressor sales to sales manager of that division, succeeding Donald (Don) Heffron, who has resigned to take up another line of work. Mr. Sedgwick brings to this responsible position the experience of over 16 years with the Le Roi Co., during which time he has served in various capacities in shop, field service, purchasing, and sales departments.

N. M. Sedgwick

▼

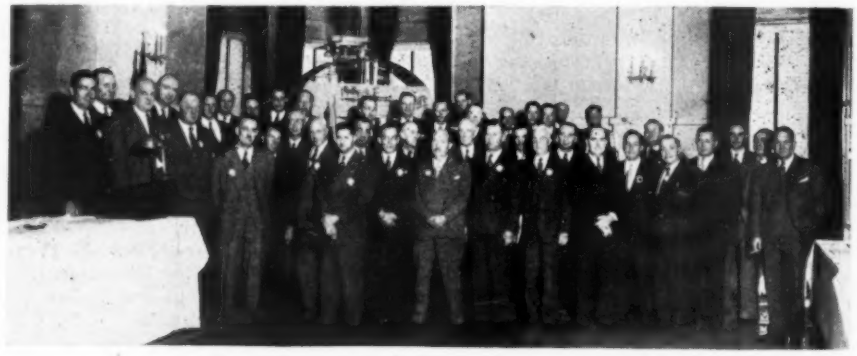
Dealers from Twenty-One States Attend Etnyre Sales Meeting

Post-war marketing policies and an active sales program were formulated by executives and dealers of E. D. Etnyre & Co., Oregon, Ill., in a joint meeting held Oct. 4-7. At this 4-day sales meeting in Oregon, Ill., Etnyre dealers had the opportunity to be present at the prevue of new Etnyre developments and a demonstration of the equipment in a tour of the plant. The business sessions extended over a two-day period enabling dealers and company officials to draw up complete operating details of their 1945 selling campaign, ready to swing into action when the company's facilities can be entirely reconverted to peacetime production. Dealers from 21 states were represented, as well as the District of Columbia and Toronto, Canada. States represented were Ohio, Wisconsin, Texas, California, Idaho, Kentucky, Georgia, Indiana, Nebraska, Washington, Illinois, Maine, Iowa, Wyoming, Virginia, Missouri, West Virginia, Utah, Colorado, Tennessee and Minnesota. Because of proximity, dealers in Ohio and Wisconsin took advantage of the opportunity to bring several members of their organization to the meeting. As an added attraction, giving a distinctive touch to the Sales Meeting, arrangements were made for the entire group to attend a national sale of thoroughbred Hereford cattle held by Etnyre, Inc., another interest of the Etnyre family.

▼

Barnhart and Townsend Promoted by Lima

Henry Barnhart, formerly manager of the Shovel and Crane Division of Lima Locomotive Works, Inc., Lima, O., has been made vice president in charge of Shovel and Crane Division. Mr. Barnhart joined the sales force of the LIMA organization in 1928 as Assistant Sales Manager. In 1936 he was made General Sales Manager of the Shovel and Crane Division, and in 1943 he was made Manager of the Division. Albert Jay Townsend, Chief Mechanical Engineer of the Lima Locomotive Works, Inc., has been appointed vice president in charge of engineering. He entered the employ of the Lima Locomotive Works, Incorporated, in 1917 as Calculator, and in 1918 was in military service as Master Engineer, A.E.F. Returning to Lima in July, 1919, he served successively as Chief Calculator, Mechanical Engineer and Chief Mechanical Engineer.



E. D. Etnyre & Co. Dealers and Executives at Sales Meeting at Oregon, Ill.

H. O. Penn Co. Holds Outing

More than 30 representatives from manufacturers met recently with the employees of the H. O. Penn Machinery Co. for an all day's outing at Carmel, New York. At the dinner "Ed" E. R. Galvin, President of Tyson Bearing Corporation and formerly of R. G. LeTourneau, Inc., presided at the speakers' table. Among the speakers were "Buck" W. H. Buchanan, Vice President and General Sales Manager of the LaPlant Choate Manufacturing Co., F. Leslie Jones, Eastern District Manager of the Bucyrus-Erie Co., Louis E. Dauer, Vice President of the Trackson Co., Henry M. Hale, Director of the Construction Machinery Division of the W.P.B., Washington, D. C., Louis S. Graham, President of D. A. Lubricants, "Bert" B. M. Clark, Sales Manager of The Heltzel Steel Form & Iron Co., Theron Howard, Sales and Service Manager of The Hyster Co., G. K. Davis, President of Athey Truss Wheel Co., "Bob" R. P. Brenner, Sales Manager of The T. L. Smith Co., Arthur J. Carleton, a New York City lawyer, Joseph C. Fiorelli, Eastern District Representative of the Friend Manufacturing Co., "Wash" W. W. Loveland, Eastern District Representative of the Barco Manufacturing Co., J. R. Overs, Factory Sales Representative of The Cleveland Trencher Co., R. G. Heckathorne, District Representative of the John Deere Plow Co., M. V. Petri, New York District Representative of the Independent Pneumatic Tool Co., "Bill" W. S. Ziegler, Eastern District Sales Representative, "Heinie" Henry M. Howard, General Sales Manager and "Hy" W. K. Cox, Assistant General Sales Manager, all of the Caterpillar Tractor Co.

▼

New Distributor for Euclid

The G. W. Van Keppel Co., 2440 Penway, Kansas City, Mo., has been appointed distributor for The Euclid Road Machinery Co., Cleveland, O., for western Missouri and the state of Kansas.

▼

G. G. Cartwright Appointed Sales Promotion Manager

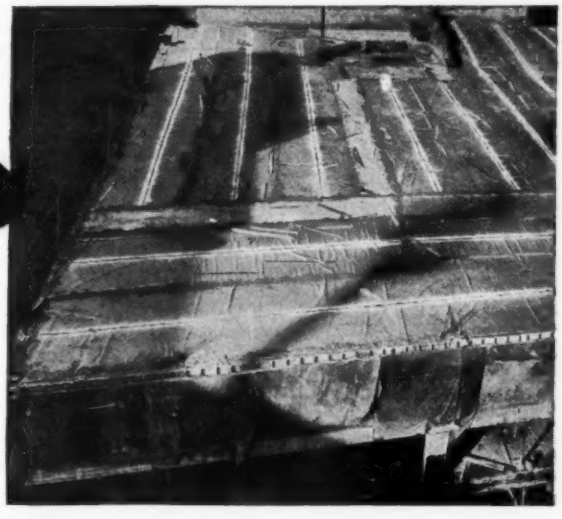
Galen G. Cartwright has been appointed manager of the Sales Promotion Department of The Goodyear Tire & Rubber Co. Mr. Cartwright, who had been assistant manager of the company's advertising department for the past three years, has been a member of the Goodyear organization since April, 1929.

When You're Pouring Concrete, Use . . .

SISALKRAFT

OVER THE SLAB . . . TO CURE AND PROTECT FROM DRIP AND DEBRIS

Waterproof, tear-resistant, scuff-proof SISALKRAFT retards evaporation and protects the concrete from dirt, dripping grout and debris.



ALL AROUND THE JOB FOR PROTECTION FROM FROST

Used all around the building, SISALKRAFT holds in the heat from salamanders or other heating units. On the large building job illustrated, the SISALKRAFT blankets are all in place, despite a gale that lasted 24 hrs.

For nearly 25 years the unmatched performance of SISALKRAFT has made it the Number One concrete curing and protecting agent. Use it when you're pouring concrete — for buildings, runways and roads.

THE SISALKRAFT CO.
205 W. WACKER DRIVE · CHICAGO 6, ILL.
NEW YORK · SAN FRANCISCO · LONDON · SYDNEY

Manufacturers of SISALKRAFT, FIBREEN, SISAL-X, SISALTAPE AND COPPER-ARMORED SISALKRAFT

J. B. Hunt & Sons New P&H Distributor

The Harnischfeger Corporation, Milwaukee, Wis., has appointed J. B. Hunt and Sons, 323 W. Martin St., Raleigh, N. C., as distributors of P&H excavators for the entire state of North Carolina. They will handle all sizes of machines up to 1½ cu. yd. capacity, including crawler cranes and truck cranes. The new distributor, who also represents the non-competitive lines of J. D. Adams Co., Hercules Steel Products, Schram, Inc. Compressors Diamond Iron Works, Buda Engines, and W. E. Grace Manufacturing Co.

▼

P. R. Ehrgott New General Sales Manager for Lima

Lima Locomotive Works, Incorporated, Lima, O., has announced the appointment of Paul R. Ehrgott as general sales manager of the Shovel and Crane Division, in charge of Domestic and Export Sales. Mr. Ehrgott was formerly district sales manager of the Eastern Pennsylvania territory with headquarters at Bethlehem, Penn. He assumed his new duties Nov. 1.

A. F. Sprankle Appointed Metallurgical Engineer for Timken

A. F. Sprankle has been appointed metallurgical engineer in The Timken Steel and Tube Division of the Timken Roller Bearing Co. He was formerly manager of the Alloy Bureau of Carnegie-Illinois Steel Corp. in the Pittsburgh District.

▼

Schoonfield Made Branch Manager

Roy Schoonfield has been appointed Acting Manager of the Washington Branch of Gar Wood Industries, Inc., by W. H. Hammond, Vice-President and Director of Branches. Schoonfield succeeds A. E. Heath, who has been assigned to other duties with the corporation.

▼

Major Firestone Returns to Memphis Plant

Major Raymond C. Firestone has returned to his former position as general manager of the Memphis plant of The Firestone Tire and Rubber Co. He was placed on the inactive list as of the Air Transport Command, after 2½ years of service, so that he could help to speed production of military and essential civilian tires.

▼

H. F. Allen Now Chief Engineer Link-Belt Speeder

Harold F. Allen has been appointed chief engineer of the Link-Belt Speeder Corporation, Chicago, Ill. He will divide his time between the Chicago and Cedar Rapids, Ia., plants. Mr. Allen became a member of the Link-Belt Locomotive Crane Division in 1916 and during this long period of service with Link-Belt and Link-Belt Speeder he has ably held numerous positions of responsibility. He has contributed many sound engineering ideas to the development of Link-Belt Speeder equipment, notably the Speed-o-Matic type of hydraulic controls. He is a graduate of Columbia University with a degree in mechanical engineering.

H. F. Allen

Here's News! **Hydraulic Brakes . . .**

on Heavy Duty Trailers

another **new development by JAHN**

Now you can get heavy duty trailers with the same kind of hydraulic brake action that has been proved so efficient and safe by truck and pleasure car manufacturers. Jahn engineers have developed and thoroughly tested hydraulic brake application on trailers with capacities of 10 to 60 tons.

This new development means smoother, faster braking action with positive, equal brake pressure on all wheels and permits unlimited axle oscillation without affecting braking action. There's no possibility of partial application or dragging of brakes when operating over rough terrain. Full motive power of the prime mover is utilized in pulling the load. There are no brake rods to require constant adjustment. Safety is increased and maintenance simplified.

When you get a heavy duty trailer, insist on a Jahn trailer with hydraulic brakes.

C. R. Jahn Company, 1345 W. 37th Place, Chicago

Any Axle or Wheel Combination

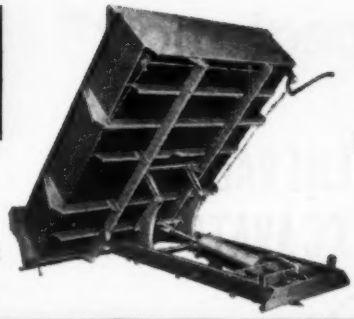
JAHN *Heavy Duty* TRAILERS

Capacities from 5 to 100 TONS

"COME TO TRAILER HEADQUARTERS"

TOUGH BODIES

FOR ALL MAKES AND MODELS OF TRUCKS



ARMY E NAVY
4th CITATION FOR WAR PRODUCTION

FOR TOUGH ASSIGNMENTS

PERFECTION "V-154 SERIES" DUMP BODIES

Made of 10 gauge steel, electrically welded throughout. Capacity, 2½ and 4 cu. yd. Lengths, 7 to 10 feet. Width, 72". Write for name of nearest Perfection distributor.

THE PERFECTION STEEL BODY CO., Galion, Ohio

PERFECTION

TRUCK BODIES AND HOISTS

GRUENDLER CRAFTSMANSHIP

Serving Industry over 50 Years

Peak Production!

150-200 TONS OF CRUSHED ROCK PER HOUR

Steam Shovel sizes to 5" to 6" minus in one-operation

These heavy plate and cast steel constructed roller bearing JAW CRUSHERS have tremendous crushing power. Built to take it for continuous operation with minimum maintenance. Built in all sizes, stationary or portable.

Complete weight of 25x42 JAW CRUSHER is 54,200 lbs.

Mfrs. of Double Roll Crushers and Hammer Crushers for Secondary Crushing requirements.

BULLETIN MAILED ON REQUEST

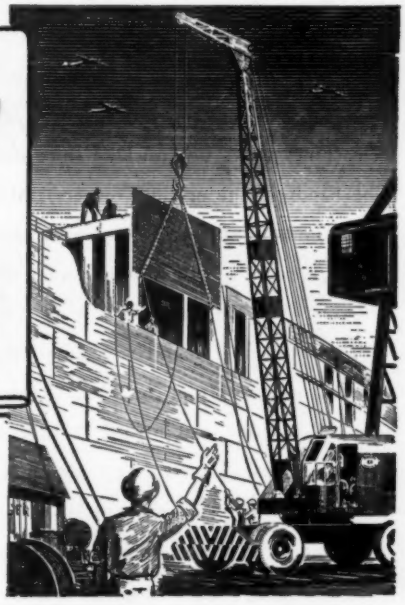
GRUENDLER

CRUSHER and PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.

Until the enemy cries "E-nuff"

THE BYERS CRANE YOU'D LIKE TO HAVE IS HANDLING SUPPLIES AND MATERIALS IN AMERICA'S SHIPYARDS



In the meantime, **owners of current and older models of Byers shovels and cranes may depend on Byers Parts Service to help them keep present equipment working steadily and satisfactorily.**

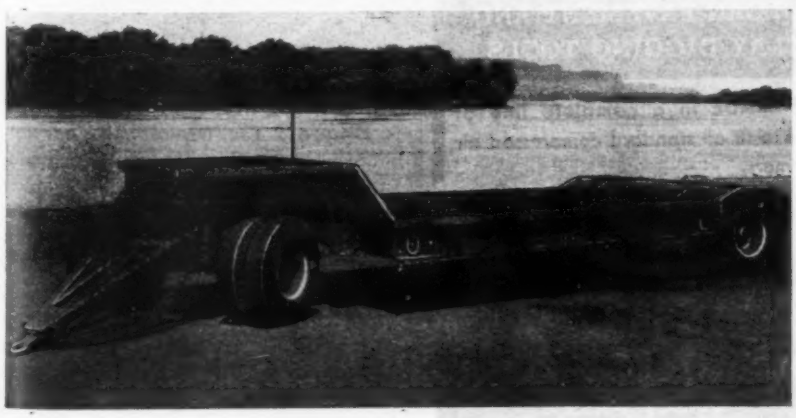
For crawler, truck mounted or self-propelled models of shovels and cranes in the portable sizes, see your nearby Byers distributor.

BYERS

CRANES AND SHOVELS

RAVENNA, OHIO

DISTRIBUTORS THROUGHOUT THE WORLD



LA CROSSE MODEL DF4-14

"As Sturdy as the Hills"

LIKE OLE MAN RIVER, LET'S KEEP ROLLIN' ALONG AND BUY MORE BONDS EVERY MONTH

LA CROSSE TRAILER & EQUIPMENT COMPANY

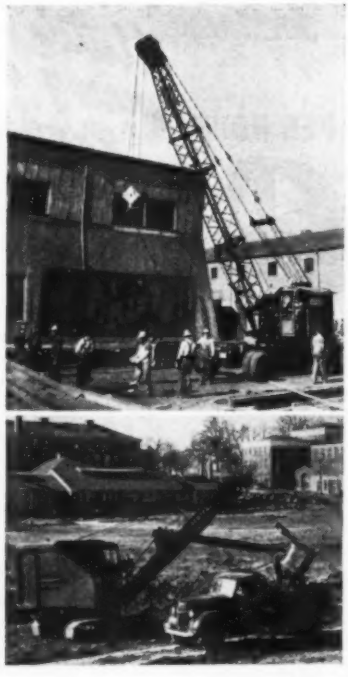
LA CROSSE -:- WISCONSIN

What's the "Life Expectancy" OF GENERAL EXCAVATORS?

Frankly, we don't know. Here's why: OF ALL THE GENERAL MACHINES EVER BUILT (over 18-year period) MORE THAN 98% ARE STILL IN SERVICE

And that isn't all! The 2% mortality includes machines unaccounted for by our records (machines we've lost track of since they left the hands of the original owners). Many of them undoubtedly are "working" and thus, *practically every General built during the past 18 years is on the job today!*

If you own a General Supercrane or Excavator, you know from experience the stamina and all-job dependability of these versatile, powerful rigs. And if you're planning now for the purchase of postwar equipment, it will pay you to get the facts on the *complete General line* including the new and revolutionary . . .



GENERAL TYPE 10

Mobile, compact combination crane-shovel-dragline. One-man, one-engine operated . . . and on rubber!

THE OSGOOD COMPANY — SHOVELS, DRAGLINES, CRANES — CRAWLER & WHEEL MOUNTS — DIESEL, OIL, GAS, ELECTRIC

Associated with The Osgood Company

GENERAL EXCAVATOR CO. — MARION, OHIO

GENERAL CRANES, DRAGLINES AND SHOVELS — DIESEL, GAS, ELECTRIC

South Bend GUTTER-SNIPE — PICK-UP STREET SWEEPERS

STREET FLUSHERS
STREET SPRINKLERS
BITUMINOUS DISTRIBUTORS
BITUMINOUS MAINTENANCE UNITS

Since 1908

MUNICIPAL SUPPLY COMPANY - SOUTH BEND 23, INDIANA

VULCAN PAVEMENT AND CLAY DIGGING TOOLS

ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

Send for NEW Vulcan illustrated CATALOG today.

VULCAN TOOLS — THE WORLD OVER — NOTED FOR QUALITY AND DURABILITY"

VULCAN TOOL MFG. CO.
QUINCY, MASS.

W. P. Mitchell Named Mack Assistant Chief Engineer

William P. Mitchell has been appointed assistant chief engineer of Mack Trucks, Inc. Mr. Mitchell recently returned from Great Britain where he had been serving in an advisory capacity on military truck transport at the invitation of the British government. Mr. Mitchell began his engineering career with the Whitlock Company in Hartford, Conn., before going overseas as a first lieutenant in World War I. After the war he returned to Whitlock, eventually going with Ace Motor Corp. as shop superintendent. He joined Mack in 1923 as a shop engineer and through a series of promotions became assistant to the chief engineer in 1937.

W. P. Mitchell

▼

Jack Randle Now with Shunk

J. R. (Jack) Randle has been appointed field service engineer for the Shunk Manufacturing Co., Bucyrus, O. Mr. Randle was field engineer for the Ingersoll-Rand Co. for 28 years. For the next 2 years he was manager of the Contractors' Division of the Illinois Powder Manufacturing Co., and for the past 2 years he was field engineer for the Cleveland Rock Drill Co. In addition to organizing and developing distribution methods, Mr. Randle also will develop new uses for the facilities of the Shunk Manufacturing Co., which is now celebrating its 90th anniversary.

J. R. Randle

▼

George M. Etnyre Resigns

Robert D. Etnyre, President of E. D. Etnyre & Co., Oregon, Ill., has announced the resignation of George M. Etnyre as general manager, secretary and treasurer of E. D. Etnyre & Co. This was presented to the Board of Directors and regretfully accepted by them at a meeting on Oct. 14. The board then proceeded to elect Joseph W. McCoy as secretary and treasurer to assume the duties immediately for the company.

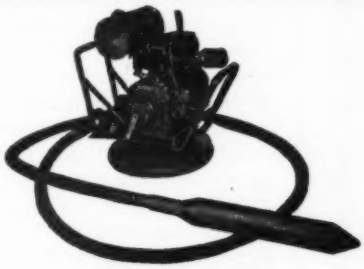
on ROGERS TRAILERS

TODAY even airplanes "bum a ride" on ROGERS TRAILERS. Deck houses for Victory ships . . . huge coastal defense guns . . . giant tanks, all are speeded towards completion and rushed to the fighting fronts on ROGERS TRAILERS.

In War and in Peace ROGERS TRAILERS have proven their ability to "deliver the goods". New models which will be available when war contracts are completed will be even better-engineered . . more efficient than the thousands which have been used successfully by industry for many years.

ROGERS BROS. CORPORATION
ALBION,
PENNA.

EXPERIENCE *builds 'em*
PERFORMANCE *sells 'em*



Concrete
VIBRATORS and GRINDERS
Write for Circular on types, sizes and Prices
ELKHART **White Mfg. Co.** INDIANA

RAPIDITY!
UNIFORMITY!
SATISFACTORY!

Contraction joints *MUST* or should be installed within the "opportune" limited time of ten minutes; this requires speed and proper machinery. All Engineers know how disastrous it is to work concrete too wet or too dry.

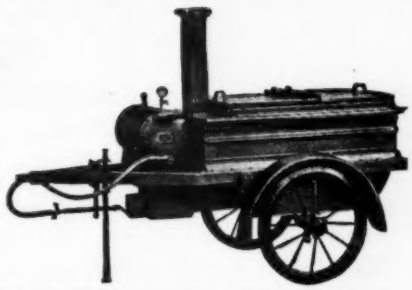
"FLEX-PLANE" mechanical joint installers for all types of joints—ribbon, premoulded, poured, cork, rubber, etc.

Ask for Bulletin E-11; it "portrays" other things you know!

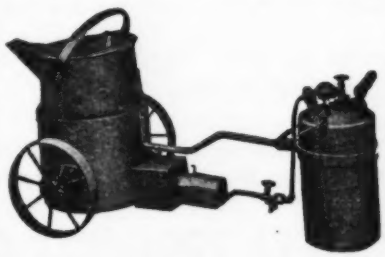
FLEXIBLE ROAD JOINT MACHINE COMPANY
WARREN, OHIO, U. S. A.

CONNERY'S HEATING KETTLE

For speedy heating of tar and asphalt—



Use this CONNERY oil-burning Patrol Patching Heater on the *small* job and this CONNERY oil-burning kettle for *large-quantity* production.



Write for catalog showing our full line of tar and asphalt heating kettles, spraying attachments, pouring sets, etc.

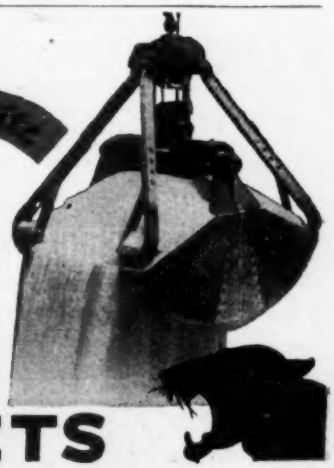
CONNERY CONSTRUCTION Co.
3900 North Second St. Philadelphia, Pa.

"A MAW-FULL" every load
"A MOUTHFUL" at Every Bite

Our landing craft, which have put hordes of fighting men and machines on enemy shores with incredible speed, have impressed the world with their efficiency.

Impressive too, is the efficiency with which Owen Buckets operate—taking capacity grabs of materials quickly—discharging them speedily—handling great yardage at low cost.

THE OWEN BUCKET CO.
6070 Breakwater Ave., Cleveland, O.
Branches: NEW YORK - CHICAGO - PHILADELPHIA - BERKELEY, CAL.



OWEN BUCKETS

"I'M SURE GLAD I PICKED HERCULES!"

"My fleet of Hercules Dumps has had a real workout the past few years, but every job has come through with colors flying.

It's really surprising how seldom Hercules bodies need service or repairs, and when they do, my Hercules distributor is right on the job.

My drivers like Hercules Hydraulic Hoists because of their ample reserve power, their dependability, and their "button-ease" dash controls, with no levers in the cab.

That Hercules slogan, "Men like to say they use them", certainly applies to me!"

Write us, or see the nearest Hercules Distributor regarding the Dump Bodies or Hoists you need now.

HERCULES STEEL PRODUCTS COMPANY
GALION, OHIO

MULTI FOOTE
CONCRETE PAVERS
Single drum 27-E and 34-E models. Also tower and inclined boom pavers. *Catalogs on request.*

ADNUN
BLACK TOP PAVERS
For Black Top paving and rock spreading. Only machine with continuous course correction.
Ask for Catalog.

THE FOOTE COMPANY, INC.
Nunda • New York

ASPHALT
for all purposes

Prompt Shipments Ample Facilities
Inquiries Solicited

Talco Asphalt & Refining Division of Southport Petroleum Company

New York 17, N. Y. 155 East 44th Street
Dallas, Texas Magnolia Bldg.
Telephone—Murray Hill 2-2088

R. A. McCorkle Appointed Manager

R. A. McCorkle has been appointed Manager of the newly created Seaboard Division of The Goodyear Export Co., a subsidiary of The Goodyear Tire & Rubber Co. In his new post Mr. McCorkle will represent the company on the eastern seaboard in all matters pertaining to export business. Managing Director of The Goodyear Tire & Rubber Co., of India, Ltd., since 1935, McCorkle has had a long and varied service record with Goodyear. He started with the company in 1913 in truck tire sales, later transferred to manufacturers' sales and was Detroit sales representative. He went with The Goodyear Export Co. in 1930 as assistant managing director of Goodyear-India and continued in that post until 1935 when he was appointed managing director of the India company.

R. A. McCorkle

▼

Worthington Names C. W. Camp Consulting Electrical Engineer

Worthington Pump and Machinery Corporation, Harrison, N. J., has announced that C. W. Camp, formerly with Crocker-Wheeler Electric Manufacturing Co. for 38 years, specializing in application engineering, is now associated with Worthington as consulting electrical engineer. A former executive member of the National Association of Electrical Manufacturers, Mr. Camp brings a wide background of experience in the electrical industry to his new work with Worthington's Public Utilities Department. Mr. Camp, who replaces the late Harry Wood, will assist in solving electrical application problems for all Worthington sales divisions and district offices. His services will also be utilized by the company's manufacturing departments.

C. W. Camp

▼

Brooks Equipment Corp Opens Chicago Office

The Brooks Equipment Corporation, 90 West St., New York 6, N. Y.,

manufacturers and designers of shaft joints, accessories and complete assemblies for hand operated remote controls, has opened an office at 1 N. La Salle St., Chicago, Ill., under the direction of James K. Grindle, of Hammond, Ind., former sales engineer for the General Electric Co. of Chicago.

▼

John G. Gasteiger Returns to Concrete Curing Industry

The Advanced Concrete Road Curing Co., New Haven, Conn., has announced the appointment of John G. Gasteiger, as sales manager of the company. Mr. Gasteiger needs no introduction to contractors and highway department officials who have had problems relating to the curing of concrete. He was recently released from the War Department, New York Ordnance District where he was Disposal Advisory officer, to re-engage himself in the particular industry in which he has been active almost continuously since 1929.

CORONACH

"Of those immortal dead who live again
In minds made better by their presence."

HENRY FOWLER, owner of John A. McGarry & Co., paving contractors, 189 Madison St., Chicago, Ill., and president of the Illinois Road Builders Association, died Nov. 5. He was 75.

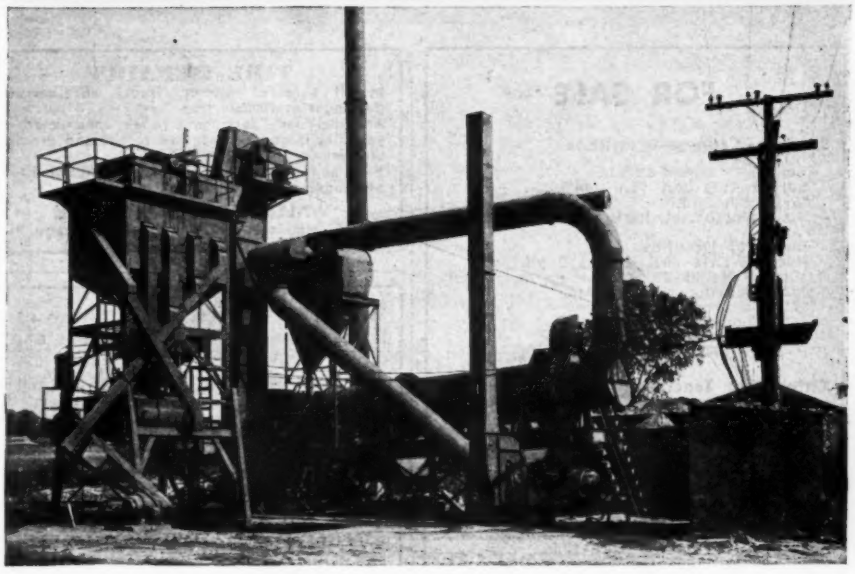
▼

PAUL D. SARGENT, former chief engineer of the Maine State Highway Commission, died suddenly Oct. 18. He was 71. He was commissioner of highways of Maine from 1905 to 1911 and then became assistant director of the U. S. Bureau of Public Roads. He left the position to become Maine chief engineer, serving until 1928. Upon leaving public service he became associated with the New England Metal Culvert Co. and Corrugated Culvert Manufacturers Association in advisory capacities. He retired about 10 years ago.

▼

JAMES R. TRUE, former state engineer of Wyoming and superintendent of the state highway department, died recently in Tacoma, Wash. He was 57. He was appointed state engineer

INCREASED EFFICIENCY
and Production
In ASPHALT MIXING . . .



FLUIDOMETER
Automatic Metering System —saves time, materials, insures accuracy and uniformity. For all types of asphalt.

☆ Compactness and a substantial increase in dryer capacity and efficiency are among the results accomplished by refinements in design in this recently completed H & B Portable (PA-30) Asphalt Plant. A larger fan is used, and the duct system from the dryer to the dust collector and from dust collector to the exhaustor has been redesigned. The new horizontal cyclone dust collector is more compact and efficient. The exhaust fan, motor which drives the dryer, and the speed reducer are combined in one completely assembled unit which is mounted on a separate platform. This decreases length of the dryer unit and greatly facilitates handling. A new type of screen reduces the overall height of the plant considerably, without reducing the bin capacity.

Further information concerning this plant will be furnished on request.

HETHERINGTON & BERNER Inc.
731 Kentucky Avenue • Indianapolis 7, Indiana

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ERIE TRUCK MIXER PLANTS

Erie builds a complete line of central concrete plants to keep truck mixers on the move.

Consult Erie now for the most modern of Post-war Plants.

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Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

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Lorain 79 Diesel Comb.
Lorain 75B and 75A gas.
55 Lorain Comb.
No. 7 Northwest, high gantry, extra long cats.
Lima 801 Dragline.
Bucyrus-Erie 50B steam 2 yd.
Marion Model 21 steam.
301 Koehring combination.
37B Bucyrus-Erie.
43B Bucyrus-Erie.
150 P & H Truck Crane.
P & H 10-wheel truck crane.

Caterpillar Tractors

D8 with 30 yd. LaPlante-Choate Scraper.
D7 with LaPlante-Choate Angledozer and 8-yd. Carryall Scraper.
BD8 with LeTourneau Angledozer.
60 with LeTourneau-Choate Dozer.
50 gas with Euclid Hydraulic Bulldozer.
30 with LaPlante-Choate Bulldozer.
30 with Bros Hydraulic Bulldozer.
D4 with LaPlante-Choate Angledozer.
D4 with Trackson High Lift.
D2 with LaPlante-Choate Bulldozer.

Tractors

Eagle 4-wheeled, 2-4 plow, rubber-tired.
Cletrac Model E with power pulley.
T-20 International with Bucyrus-Erie Angledozer.
Two 10-20 Internationals, rubber-tired.

Graders

77 Austin-Western.
99 Austin-Western.

Scrapers

Model J 12-yd. Carryall.
Euclid 5' and 6' Rotary.
Euclid 2-wheel trailer type.

Miscellaneous

Three Koehring Dumpsters with Cummins Diesel Engines.
P & H Backfiller, completely rebuilt.
Foote No. 26 Paver.
Jaeger 7S Concrete Mixer, power hoist, 4 rubber heavy duty 6-ply tires.

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In all sizes of tractor, truck, wheelbarrow, passenger or 1800x24 tires.
An Equa-Flex "Sectional" repair constructed in your tire is guaranteed. Best results and prompt service!
It is a fact that we do repair run flat tires, passenger and truck, without a reliner!

WALLACE TIRE SERVICE, Inc.
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WANTED—Superintendent who can take complete responsibility in handling REA projects, including estimating and construction. Man with several years' experience preferred. Box 400, Roads & Streets, 330 So. Wells Street, Chicago, 6, Illinois.

WANTED TO BUY OR RENT

Contractor's equipment, shovels, tractors, bulldozers, etc. List your construction equipment with us. Contractors Equipment Company, 1340-42 Lynn Street, Parkersburg, West Virginia.

ASPHALT EQUIPMENT

5—¼, 1 & 2 Ton Asphalt Plants.
3—½ Ton & 1 Ton Asphalt Mixers.
8—12,000 & 18,000 Gal. Cap. Tanks.
5—800 & 1,200 Gal. Distributor Trucks.
3—B. G. 842 & 848 Portable Plants.

R. C. STANHOPE, INC.
60 East 42nd St. New York 17, N. Y.

WANT TO BUY

2 Gunite Machines.
2—1¼ or 1½ Yd. Elec. Shovels.
1—1000 to 15,000 Ft. Air Comprsesor.
1 Ton or 3 Ton Asphalt Plant.
2—12,000 to 18,000 Gal. Tanks.

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Darien Conn.

THAW CULVERTS and HYDRANTS with an AEROIL

No. 98 Portable Steam Thawer

A handy steam plant with a detachable thawing torch. Used by leading Highway Departments for Culvert Thawing. Special Culvert Nozzle (10 ft.) available. Send for WINTER CATALOG No. 234-S including Concrete Heaters, Portable Coil Water Heaters, Thawing Torches, Ground Thawers, Salamanders, Tar and Asphalt Heaters, etc.

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Branches: Chicago, San Francisco, Dallas

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Asphalt Paving Supt., 35 years' experience road and street construction, can build dryers, mixers and melting kettles, or complete plants, large or small. Wants job with paving contractor or manufacturer contemplating or building asphalt paving equipment. Box 300, Roads and Streets, 330 So. Wells Street, Chicago 6, Illinois.

ASPHALT PLANTS

2 Ton Cummer Stationary.
1½ Ton Cedar Rapids Portable Diesel.
2—1000 lbs. Cummer Portable.
3—2500 and 10,500 bbl. Oil Tanks.

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WANTED TO BUY

Low semi-trailer, standard make, with tandem axle with not less than twelve wheels, minimum capacity 20 tons—25 preferred.

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FOR SALE

Austin mootr grader, shop No. 271 dual rear, single front. Hydraulic blade and scarafier. Buda engine, run very little since overhauled. Bargain at $1,150.00 FOB Rome, Georgia. Private Company selling. **Box 160 Roads and Streets, 330 So. Wells St., Chicago 6, Ill.**

FOR SALE

1—Ord Finishing Machine—20'-22'
1—Ord Finishing Machine—10' Power Take-off
1—42" Austin Elevating Grader with Power Take-off.
1—Adams 12 ft. Leaning Wheel Blade Grader
1—Austin Hydraulic 12-yd. Scraper
1—80 H.P. Cletrac (Crawler)—Gas

CHICAGO HEIGHTS COAL CO.
Chicago Heights, Illinois

NOTHING LIKE All-Wheel-Drive

FOR ROAD-BUILDING AND SNOW REMOVAL

●Standard Ford economy and efficiency, with the added advantages of *traction on all wheels* gets the hard, tough jobs done faster and at lower cost. Write for literature.

MARMON-HERRINGTON CO., Inc.
INDIANAPOLIS 7, INDIANA, U. S. A.

in 1915 and was named head of the highway department in 1934. He resigned in 1937.

▼

GEORGE R. MERRILL, county engineer of Middlesex County, New Jersey, since 1932, died Oct. 29 at the age of 54.

▼

RALPH L. WARREN, director of Warren Brothers Co., Boston, Mass., died Oct. 27, aged 70.

▼

E. EDWIN BLOMGREN, District Engineer of the Michigan state highway department for the counties of Southwestern Michigan for the last 5 years, died Oct. 11 of a heart attack. From 1933 to 1938 he was maintenance engineer of the State Highway Department. He was 55.

▼

CHARLES J. POPELKA, city engineer of Beloit, Wis., died suddenly Oct. 14 aged 53. He had been with the city engineering department for 25 years.

▼

LEE CRAFT, county highway superintendent of Fall River County, S. Dak., for the past 21 years, died recently. He was 59.

▼

FREDERICK TENCH, President of Terry & Tench, 10 East 43rd St., New York, died Oct. 27 at the age of 82. His company erected the Bear Mountain Bridge over the Hudson River and several sections of the Williamsburg and Manhattan Bridges in New York City. It is estimated that his company erected structures in the east valued at $100,000,000.

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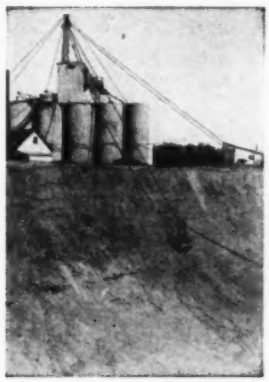
Long Range Machines

Save Power! Save Labor! Cut Costs!



Picture shows a Sauerman Slackline Cableway lifting gravel from a wide, deep pit to a hopper on top of a screening plant. The cost of operation is only a few cents per yard handled and the machine cleans up every yard of material within a 900-ft. radius of plant.

MANY excavating jobs involving hauls of 100 to 1500 ft. are simplified by using a Sauerman Power Scraper or Slack-line Cableway which digs, conveys and places the materials in one operation.

First cost of a Sauerman Machine is reasonable, maintenance expense is small and labor is reduced to a minimum. Moreover this equipment is very flexible; is readily adapted to meet any new working conditions.

A wide choice of sizes is available, offering handling capacities all the way from 10 to 600 cu.yd. an hour.

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Proved record of superior performance. Made of specially developed steel to withstand severe service conditions.

FOR ALL TYPES AND MODELS OF SNOW PLOWS
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Amazingly effective. Thoroughly breaks up and removes heavy, slippery ice and snow formations. Replaces all types of snow plow blades or maintenance units. Write for Bulletin and name of nearest Distributor.

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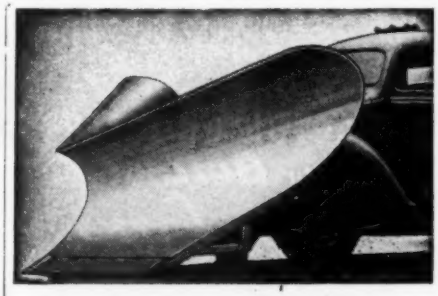

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Builders of road maintenance equipment since 1890

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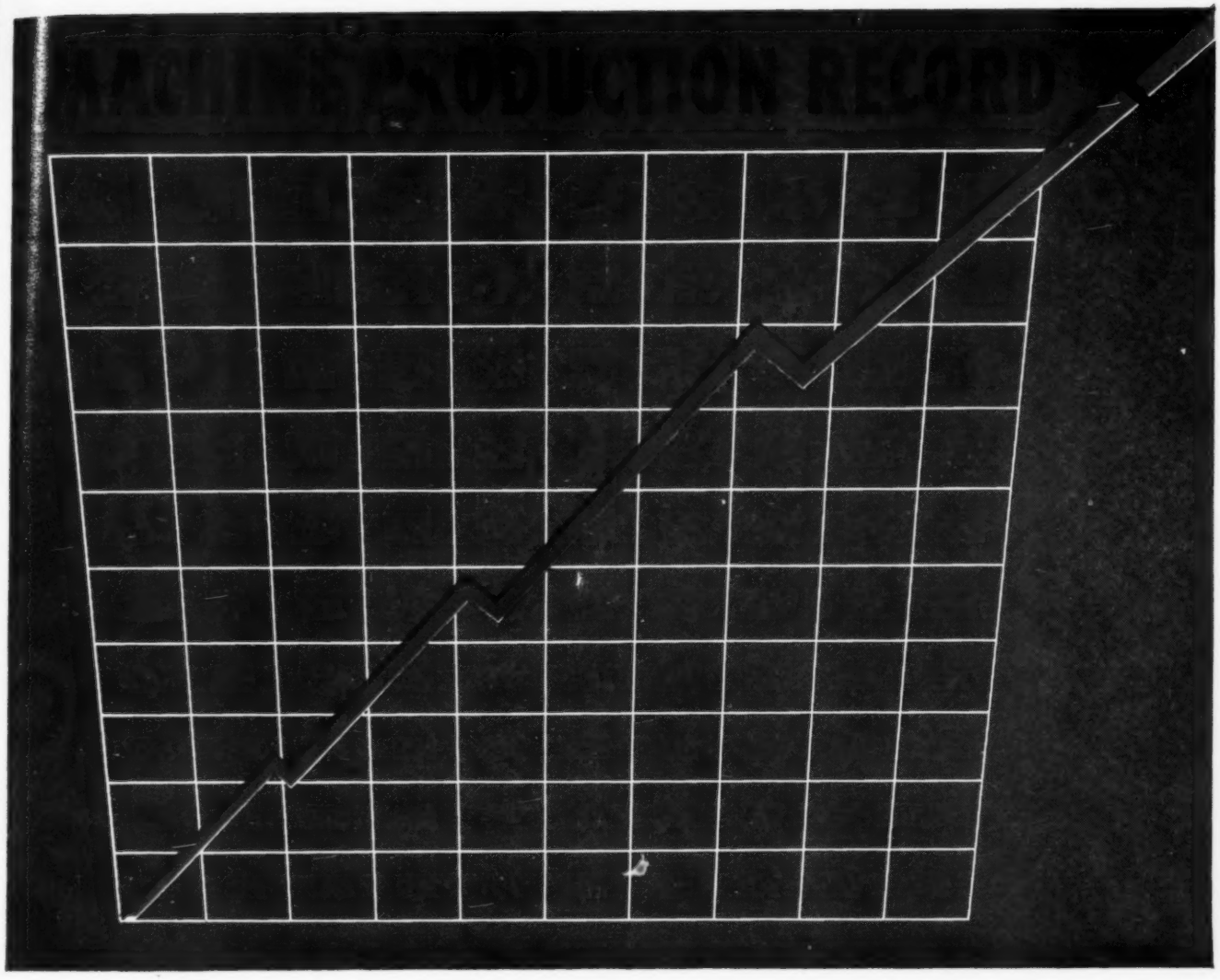

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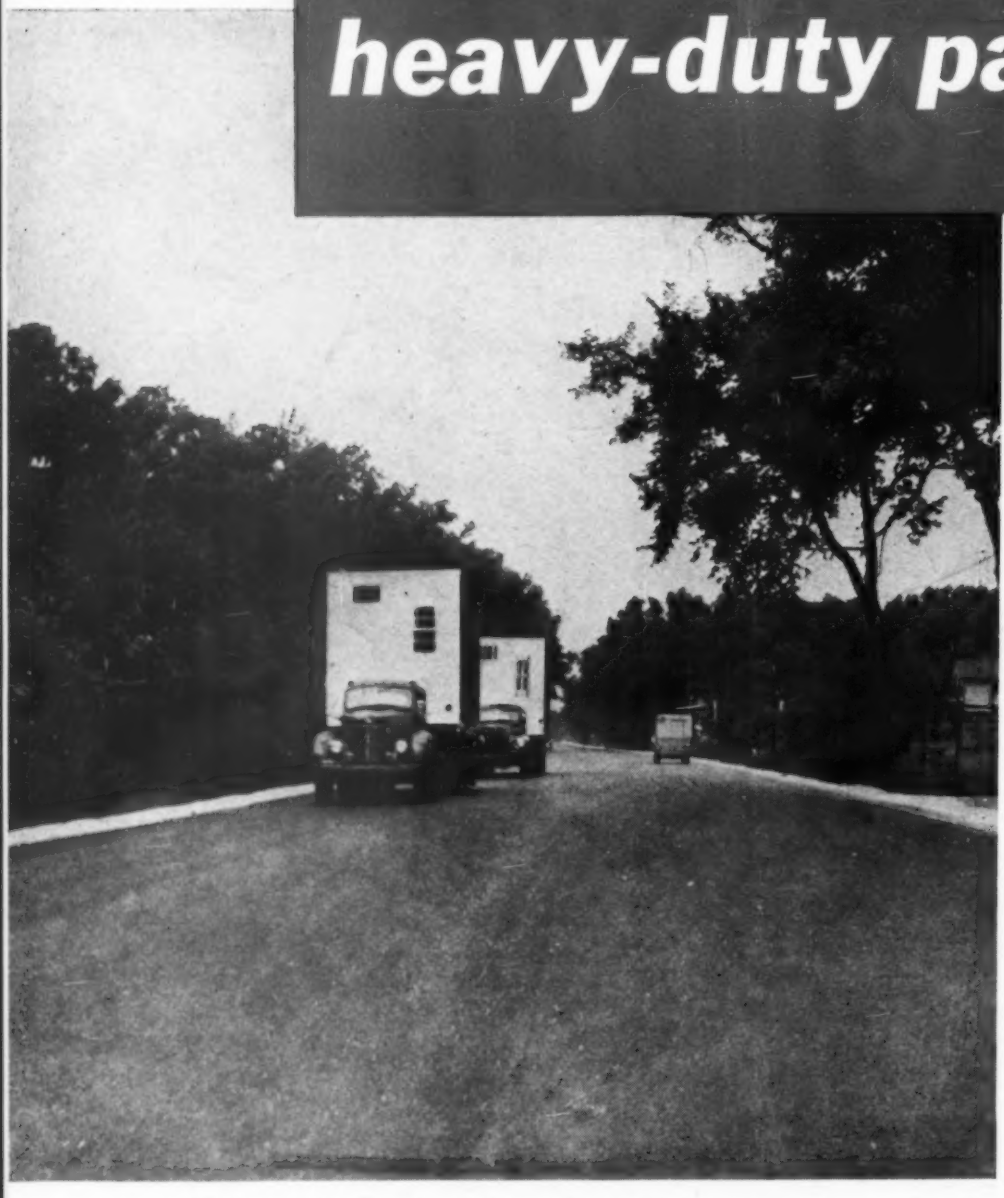

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REG. T. M.

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